United States Department of Agriculture

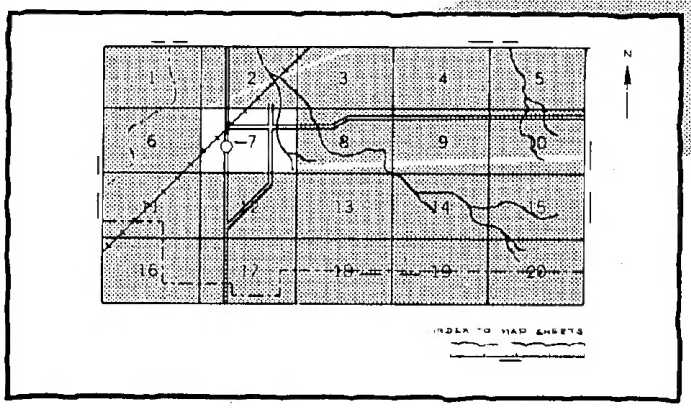
Soil Conservation Service

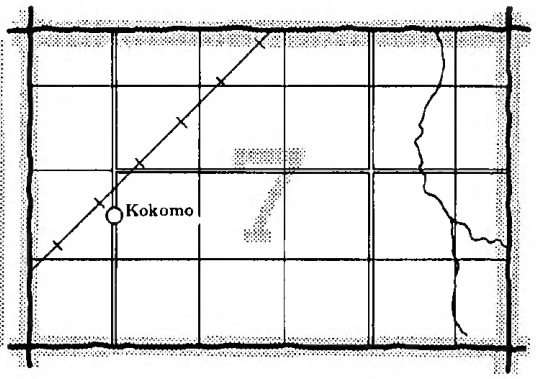
In cooperation with University of Georgia College of Agriculture Agricultural Experiment Stations and The Consolidated Government of Columbus, Georgia

Soil Survey of Muscogee County, Georgia

HOW TO USE

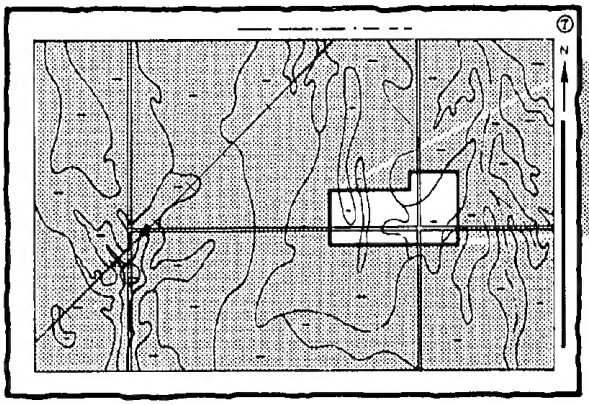
1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

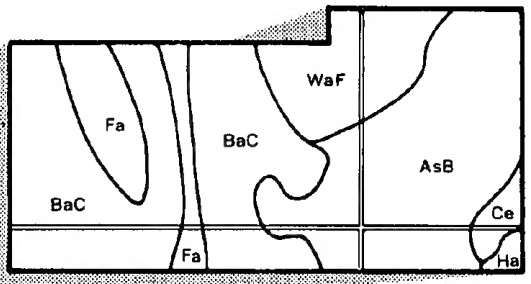




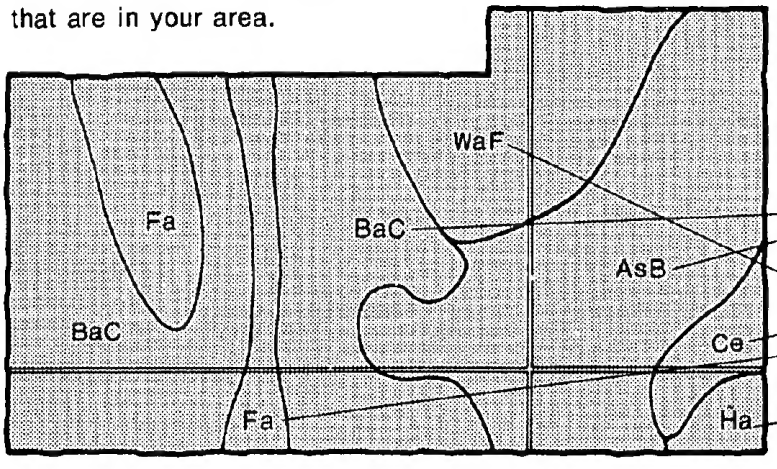
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.





4. List the map unit symbols that are in your area.

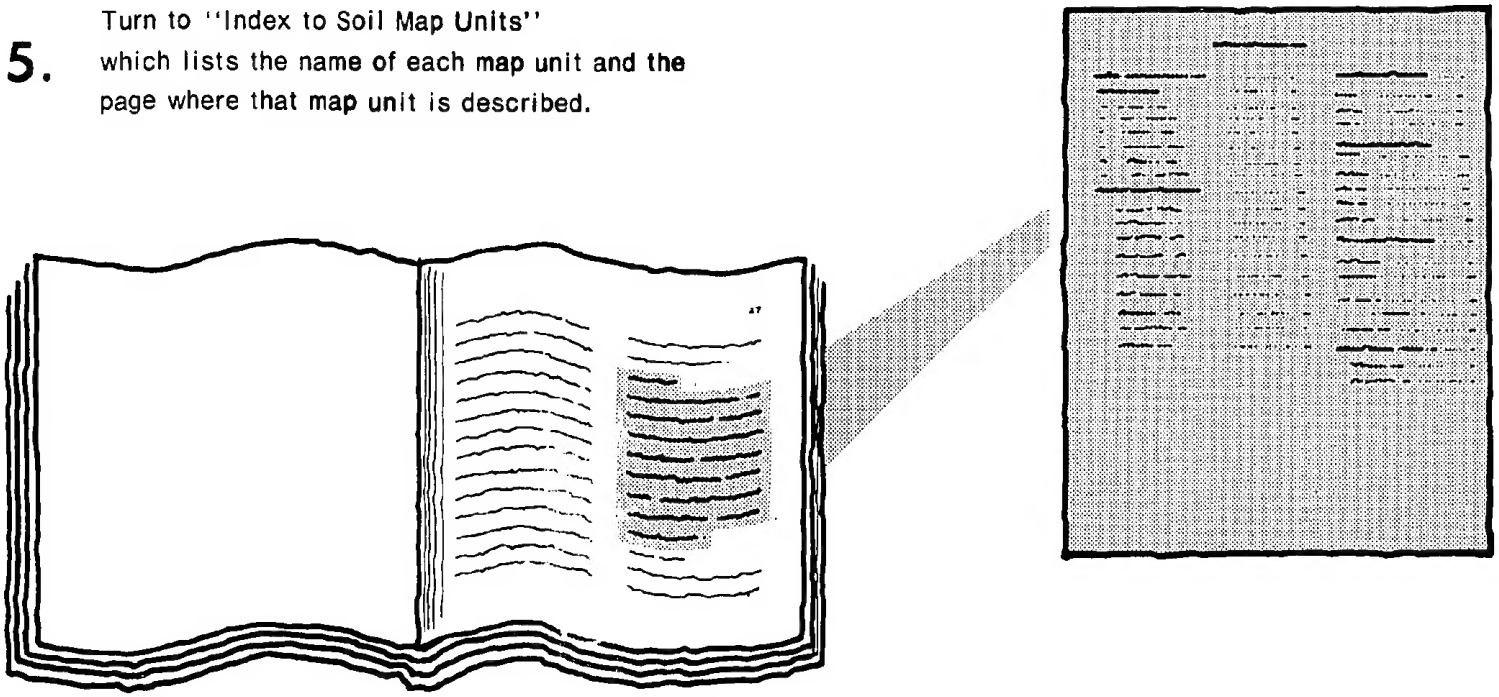


Symbols

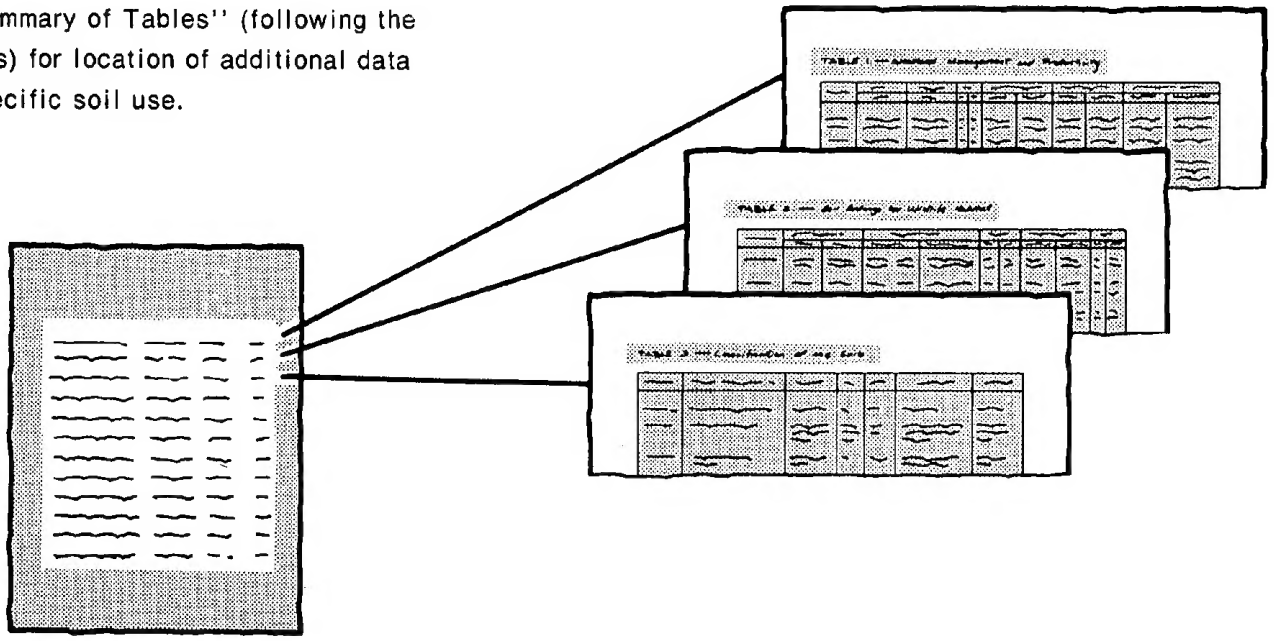
AsB
BaC
Ce
Fa
Ha
WaF

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1976-1979. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. This survey was made cooperatively by the Soil Conservation Service; the University of Georgia, College of Agriculture, Agricultural Experiment Stations; and The Consolidated Government of Columbus, Georgia. It is part of the technical assistance furnished to the Pine Mountain Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

A previous soil survey of Muscogee County was published in 1926 *(6)*. The present survey updates the earlier survey and provides additional information.

Cover: The northern part of Columbus, Georgia, as viewed looking northeast. The watershed lake protects downstream communities and transportation facilities. Recreation areas are associated with the lake. Urban areas cover much of Muscogee County. The Cecil, Dothan, and Pacolet soils, which are common in the northern part of the county, provide suitable sites for community development.

contents

soil series

Issued April 1983

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summary of tables

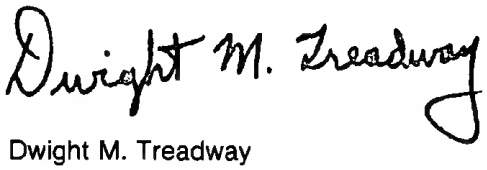
foreword

This soil survey contains information that can be used in land-planning programs in Muscogee County, Georgia. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

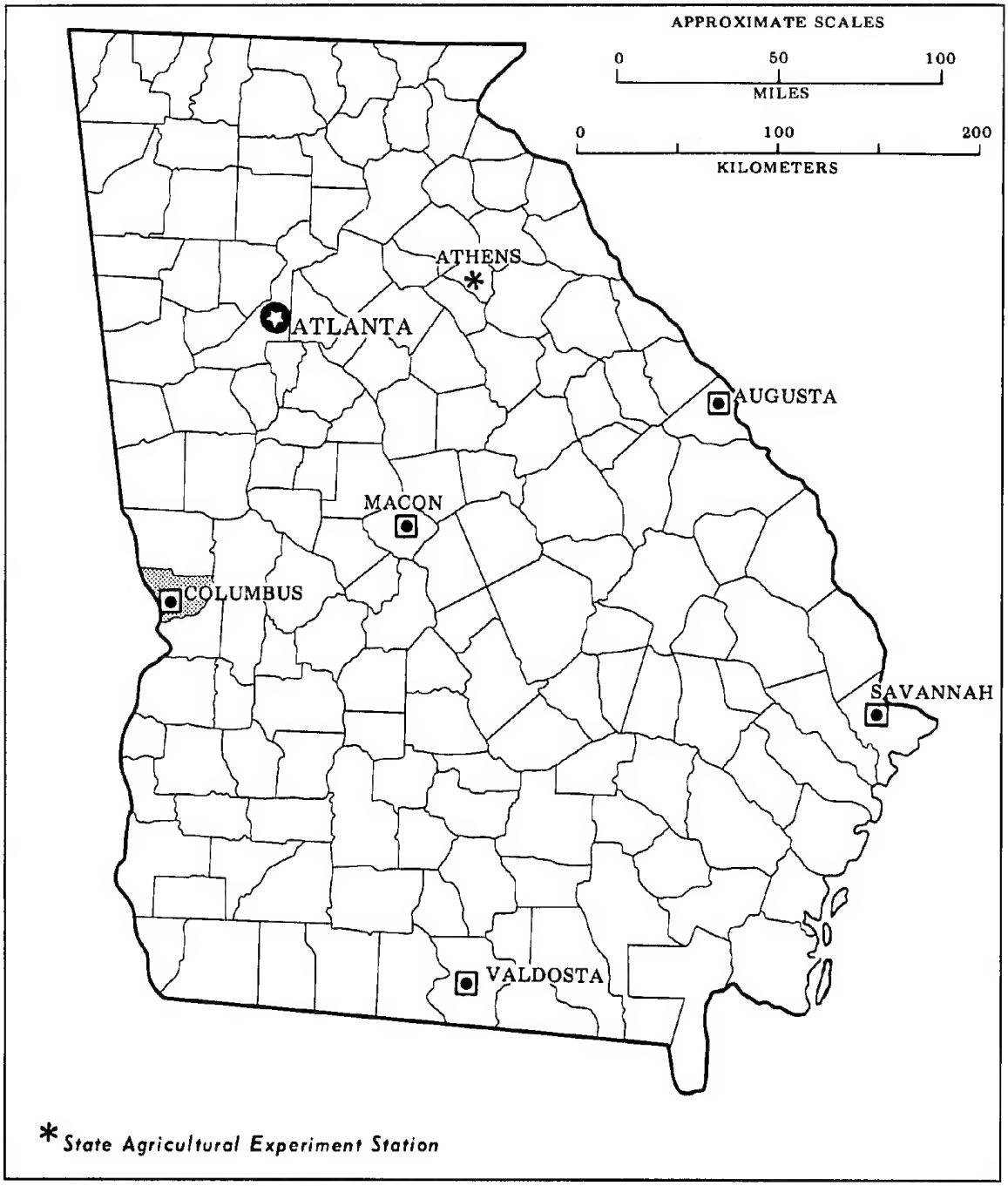
This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.



Dwight M. Treadway
State Conservationist
Soil Conservation Service



Location of Muscogee County in Georgia.

soil survey of
Muscogee County, Georgia

by John H. Johnson, Soil Conservation Service

fieldwork by Steve K. Higgins, Mark S. Hodges, John H. Johnson, and Mack Thomas, Jr., Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
in cooperation with the University of Georgia
College of Agriculture, Agricultural Experiment Stations
and The Consolidated Government of Columbus, Georgia

MUSCOGEE COUNTY is in the west-central part of Georgia. It is nearly rectangular and has a land area of 220.4 square miles, or 141,056 acres. Muscogee County is about 22 miles at its widest point and about 20 miles at its longest point. Columbus, the county seat and largest city, is in the western part of the county near the head of navigation on the Chattahoochee River. It is the primary trade center for west-central Georgia and east-central Alabama.

Muscogee County is in three major land resource areas. The northern part of the county is in the Southern Piedmont, most of the eastern part is in the Carolina and Georgia Sand Hills, and much of the southwestern part is in the Southern Coastal Plain.

The Southern Piedmont consists mostly of very gently sloping to steep, well drained soils on uplands. These soils have a loamy surface layer and a clayey subsoil. The Carolina and Georgia Sand Hills are dominantly very gently sloping to moderately steep, well drained soils on uplands. These soils commonly have a thick sandy surface layer and subsurface layer and a loamy subsoil. In places, the subsoil is mostly firm and brittle. The Southern Coastal Plain is made up mostly of nearly level to gently sloping, well drained soils on uplands. These soils have a sandy or loamy surface layer and a loamy subsoil.

About 17 percent of Muscogee County is nearly level alluvial plains and stream terraces. The soils on alluvial plains near the Chattahoochee River and its tributaries are well drained to poorly drained. They are dominantly loamy throughout. Soils on stream terraces are well drained and moderately well drained. They have a loamy surface layer and a loamy or clayey subsoil.

general nature of the county

This section gives general information about Muscogee County. It discusses climate; settlement and history; and physiography, relief, and drainage.

climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Muscogee County has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short, with only a rare cold wave that moderates in 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer precipitation, mainly afternoon thundershowers, is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Columbus, Georgia in the period 1951 to 1977. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 48 degrees F, and the average daily minimum temperature is 37 degrees. The lowest temperature on record, which

occurred at Columbus on January 24, 1963, is 3 degrees. In summer the average temperature is 80 degrees, and the average daily maximum temperature is 90 degrees. The highest recorded temperature, which occurred on July 7, 1977, is 104 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 51.35 inches. Of this, 26 inches, or 50 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 22 inches. The heaviest 1-day rainfall during the period of record was 5.32 inches at Columbus on August 3, 1977. Thunderstorms occur on about 60 days each year, and most occur in summer.

Average seasonal snowfall is less than 1 inch. The greatest snow depth at any one time during the period of record was 14 inches. On an average, seldom is there a day with at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 50 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 70 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the northwest. Average windspeed is highest, 8 miles per hour, in spring.

Severe local storms, including tornadoes, strike occasionally in or near the area. They are short and cause variable and spotty damage. Every few years, in summer or autumn, a tropical depression or remnant of a hurricane which has moved inland causes extremely heavy rains for 1 to 3 days.

settlement and history

Muscogee County was named for one of the largest and most influential of the Creek Indian tribes, the Muscogees. From 1739, when James Edward Oglethorpe, founder of Georgia, signed a treaty with the Creek Indians, until 1826, Muscogee County included what is now Chattahoochee, Harris, Macon, Marion, Schley, Talbot, and Taylor Counties. By 1854, areas of Muscogee County had been divided to form the previously named counties.

In 1971, the Columbus-Muscogee County Consolidated Government was formed. It serves as one unit of government and includes all of the survey area except for 41,056 acres in the Fort Benning Military Reservation.

During the past decades, the population of the survey area has steadily increased. In 1960, the population of Muscogee County was 159,000; in 1970, it was 172,042. The rural areas are changing from agricultural to residential, community, and industrial use. In 1969, 17,931 acres was farmed. In 1974, this area had been reduced to 13,295 acres.

physiography, relief, and drainage

The northern part of Muscogee County is in the Southern Piedmont Major Land Resource Area. This resource area consists of narrow, convex ridgetops and hillsides dissected by numerous small winding drainageways. Slopes commonly are smooth. The soils are very gently sloping to steep. Deep valleys and sloping to steep hillsides are between the larger creeks in the northwestern part of the county. Nearly level alluvial plains are along the Chattahoochee River and many of its tributaries. In most places, the tributaries are narrow and are frequently flooded in winter and early in spring.

Most of the eastern part of the county is in the Carolina and Georgia Sand Hills Major Land Resource Area. This area separates the Southern Piedmont from the Southern Coastal Plain. Ridgetops are smoother and broader than ridgetops in the Southern Piedmont. In places, however, the landscape is rolling or hilly and is dissected by many narrow valleys and drainageways.

The southwestern part of the county is in the Southern Coastal Plain Major Land Resource Area. Very gently sloping soils are on medium ridgetops. The hillsides extend to the small drainageways, but they commonly are not as steep as those of the Southern Piedmont and the Sand Hills.

Nearly level soils on alluvial plains are along the Chattahoochee River, Upatoi Creek, and their tributaries. The alluvial plains commonly are wider in the Sand Hills and Southern Coastal Plain than in the Southern Piedmont.

Elevation ranges from 612 feet in the northwestern part of the county to 190 feet in the southwestern part.

The Chattahoochee River, Upatoi Creek, and their tributaries drain most of the county. The Chattahoochee River separates the western boundary of Muscogee County from Alabama and generally flows southeasterly; it intersects Upatoi Creek at the southwestern corner where it leaves the County. Baker Creek separates the northeastern part of Muscogee County from Talbot County. Upatoi Creek separates most of the eastern and southern parts of the county from Chattahoochee County (fig. 1). These creeks generally flow southwesterly into the Chattahoochee River. Important tributaries of the Chattahoochee River are Upatoi, Standing Boy, Heiferhorn, and Roving Branch Creeks. Important tributaries of Upatoi Creek are Baker, Tar River, and Cow Creeks. These creeks and rivers are throughout the county and form a well defined drainage pattern.

The soils on uplands predominately are well drained; those on stream terraces are somewhat poorly drained to well drained. The soils along the rivers and the

smaller streams are well drained to poorly drained and are subject to overflow in winter and early in spring; however, soils along the Chattahoochee River are protected by dams.

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately.

Figure 1.—Erosion of the streambank along Upatoi Creek in an area of Eunola sandy loam, 0 to 3 percent slopes. Cutting away of the bank jeopardizes potential land use and adds sediment to the stream.

The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

general soil map units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The soils in the survey area differ in suitability for major land uses. In this section, the major land uses for each unit are given, the main concerns of management are pointed out, and soil properties that limit use are indicated. Cultivated crops mainly are corn and soybeans. Pasture crops are mainly improved bermudagrass, bahiagrass, and tall fescue. Woodland is land that produces either native trees or introduced species. Nonfarm uses include residential, commercial, and industrial developments, campsites, picnic areas, ballfields, and other areas used for intensive recreation.

soil descriptions

soils on alluvial plains and stream terraces

The two map units in this group are made up of well drained to poorly drained soils that are nearly level. The soils have a predominately brownish, sandy or loamy surface layer and a predominately brownish or mottled, loamy underlying layer or subsoil. Soils in the Chewacla-Dogue map unit are protected from flooding. Soils in the Bibb-Toccoa-Pelham map unit are subject to frequent flooding.

1. Chewacla-Dogue

Nearly level, somewhat poorly drained and moderately well drained, loamy and clayey soils; on alluvial plains and stream terraces

The soils in this map unit are on alluvial plains and stream terraces mainly along the Chattahoochee River. They mostly have low relief. Some soils are somewhat poorly drained, and others are higher lying and better drained. Brief periods of flooding occur in winter and early in spring in low lying areas. Areas along the Chattahoochee River are protected from major flooding. Slope is less than 2 percent.

This map unit makes up about 5 percent of the county. It is about 64 percent Chewacla soils, 8 percent Dogue soils, and 28 percent soils of minor extent.

Chewacla soils are somewhat poorly drained and are on the alluvial plain. Typically, the surface layer is dark brown loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. The upper few inches of the subsoil is reddish brown sandy clay loam that has grayish brown mottles; the middle part is grayish brown and yellowish brown sandy clay loam that has strong brown, yellowish brown, and light brownish gray mottles; and the lower part is mottled yellowish brown, light brownish gray, and strong brown clay loam.

Dogue soils are moderately well drained and are on stream terraces. Typically, the surface layer is brown loam about 5 inches thick. The subsoil is clay to a depth of 60 inches or more. The upper few inches is predominately yellowish brown, and the rest of the subsoil is mottled brownish, yellowish, grayish, and reddish.

Of minor extent in this map unit are mainly Bibb, Congaree, Masada, Pelham, Toccoa, and Wickham soils. Poorly drained Bibb and Pelham soils, moderately well drained Congaree soils, and well drained Masada, Toccoa, and Wickham soils are on the alluvial plains or stream terraces with the major soils.

Areas of this map unit are mostly wooded or idle. In some areas, however, the soils are moderately well drained and are used for cultivated crops or pasture. A city landfill is in this map unit. Most areas of this map unit are moderately suited to farming and well suited to the production of forest products. If this map unit is used for woodland, equipment limitations and seedling mortality are management concerns on most of the areas. Within the areas protected from flooding, there is

considerable industrial, urban, and recreation development. However, other areas are severely limited for urban use and are poorly suited to recreation development. Clay has been mined for the manufacture of bricks, and the excavated areas are filled with water. Flooding and wetness are the chief concerns of management for most areas.

2. Bibb-Toccoa-Pelham

Nearly level, poorly drained and well drained, predominately loamy soils; on alluvial plains

The soils in this map unit are on alluvial plains of the major tributaries of the Chattahoochee River. Flooding is possible throughout the year; frequent, brief periods of flooding occur in winter and in spring.

This map unit makes up about 12 percent of the county. It is about 28 percent Bibb soils, 28 percent Toccoa soils, 22 percent Pelham soils, and 22 percent soils of minor extent.

Bibb soils are poorly drained and are in low parts of the alluvial plain. Typically, the surface layer is about 17 inches thick. The upper few inches of the surface layer is black sandy loam, and the lower part is dark gray loamy sand. The underlying material to a depth of 60 inches or more is layers of dark gray sandy loam and loamy sand.

Toccoa soils are well drained and are on the higher parts of the alluvial plain. Typically, the soil is brownish sandy loam to a depth of 60 inches or more. Flakes of mica commonly are throughout the soil.

Pelham soils are poorly drained and are in depressional areas on the alluvial plain. Typically, the surface layer is very dark gray loamy sand about 5 inches thick. The subsurface layer to a depth of 23 inches is gray loamy sand that has yellowish brown mottles. The subsoil is predominately sandy clay loam to a depth of 72 inches or more. It is gray and has light yellowish brown mottles.

Of minor extent in this unit are Eunola, Chastain, and Wahee soils and Hydraquents. Moderately well drained Eunola and somewhat poorly drained Wahee soils are on higher lying stream terraces adjacent to the major soils. Chastain soils and Hydraquents are on low lying areas adjacent to the major soils.

Areas of this map unit are mostly wooded. The soils are well suited to the production of forest products. Wetness is the main limitation to equipment use in managing and harvesting trees. However, operations can be successfully performed during drier seasons. The soils are poorly suited to farming and urban uses. Flooding and wetness are the chief concerns of management for most uses.

Urban land and soils on stream terraces and uplands of the Southern Coastal Plain

The one map unit in this group is made up of Urban land and well drained or moderately well drained soils that are nearly level and very gently sloping. The soils in the Urban land areas have been altered by cutting, filling, and shaping. They are in business districts, or are used for residential, community, or industrial development. The unaltered soils have a brownish, sandy or loamy surface layer and a brownish or yellowish, loamy subsoil that is mottled.

3. Urban land-Dothan-Eunola

Urban land interspersed with nearly level and very gently sloping, well drained and moderately well drained soils that have a sandy or loamy surface layer and a loamy subsoil

The Urban land and the soils in this map unit are mainly nearly level and very gently sloping; a few areas in the northern part, however, are gently sloping. This map unit is on uplands and terraces. Most of the metropolitan area of Columbus and its associated communities are in areas of this map unit. Much of the surface area is covered by urban development, but in places, Dothan and Eunola soils are not covered. These soil areas are used for lawns, parks, and cemeteries, or they are vacant lots. Slope is predominately 0 to 5 percent.

This map unit makes up about 16 percent of the county. It is about 42 percent Urban land, 33 percent Dothan soils, 9 percent Eunola soils, and 16 percent soils of minor extent.

Typically, most areas of Urban land are business districts, shopping centers, schools, churches, parking lots, motels, industries, streets and sidewalks, and housing developments. The soils have been altered by cutting, filling, and shaping. In places, cuts are deep, and weathered bedrock or clayey and sandy sediment is exposed.

Dothan soils are well drained and are on uplands. Typically, they have a dark brown loamy sand surface layer about 8 inches thick. The subsoil is predominately sandy clay loam to a depth of 60 inches or more. The upper part of the subsoil is strong brown; the middle part is yellowish brown and brownish yellow; and the lower part is mottled brown, gray, and red and is 5 to 10 percent plinthite. A few nodules of ironstone are in the surface layer and in the upper part of the subsoil.

Eunola soils are moderately well drained and are on stream terraces. Typically, the surface layer is dark grayish brown sandy loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part of the subsoil is very pale brown sandy loam; the middle part is mainly yellowish brown sandy clay loam that has brown, red, and gray mottles; and the lower part is mottled yellowish brown, strong brown, yellowish red, and light gray sandy loam.

Of minor extent in this map unit are the well drained Ailey, Orangeburg, and Wagram soils on uplands. Ailey and Orangeburg soils are on the more sloping ridgetops and hillsides. Very gently sloping Wagram soils are on ridgetops.

Much of this map unit is in residential, commercial, or industrial development and other associated land uses. However, moderately slow permeability or seasonal wetness is a concern in most places.

soils on uplands of the Southern Piedmont

The two map units in this group are made up of well drained soils that are very gently sloping on narrow ridgetops and gently sloping to steep on convex hillsides. The soils have a brownish, loamy surface layer and a predominately reddish, clayey subsoil.

4. Piedmont-Cecil-Wedowee

Very gently sloping and gently sloping, well drained soils that have a loamy surface layer and a predominately clayey subsoil; on ridgetops and hillsides

The very gently sloping soils in this map unit mainly are on narrow ridgetops, and the gently sloping soils are on short, convex hillsides. These soils mainly are in the northern part of the county. Slope is 2 to 10 percent.

This map unit makes up about 11 percent of the county. It is about 37 percent Pacolet soils, 30 percent Cecil soils, 19 percent Wedowee soils, and 14 percent soils of minor extent.

Pacolet soils have a red subsoil that is thin. Typically, the surface layer is reddish brown sandy clay loam about 1 inch thick. The subsoil extends to a depth of about 35 inches. The upper few inches is clay loam, the middle part is clay, and the lower part is clay loam. The underlying material to a depth of 60 inches or more predominately is weathered granite and gneiss.

Cecil soils have a predominately red subsoil that is thick. Typically, the surface layer is reddish brown sandy clay loam about 5 inches thick. The subsoil extends to a depth of 45 inches. The upper part is mainly sandy clay, the middle part is predominately clay that has reddish yellow mottles, and the lower part is sandy clay loam that has brownish yellow mottles. The underlying material to a depth of 60 inches or more is red weathered granite that has yellow mottles.

Wedowee soils have a predominately mottled subsoil that is thin. Typically, the surface layer is grayish brown sandy loam about 5 inches thick. The subsoil extends to a depth of about 37 inches. The upper part is yellowish red sandy clay loam, the middle part is yellowish red sandy clay that is mottled red and strong brown, and the lower part is mottled yellowish brown and red sandy clay loam. The underlying material to a depth of 60 inches or more is weathered gneiss and granite.

Of minor extent in this map unit are the well drained Hiwassee and Vance soils, and Urban land that is associated with community development. The minor soils and the Urban land are on the ridgetops and hillsides with the major soils.

Areas of this map unit are mostly wooded or are used for residential communities, recreational areas, shopping centers, and light industry. A few areas are in pasture. Most of the soils are moderately suited to farming. Most of the soils on ridgetops are well suited to the common urban and recreational uses. However, most soils on hillsides are less well suited to these uses because of slope. The clay content and permeability of the soil need to be considered before installing tile for septic tank absorption fields or other similar uses. Slopes that have no vegetative or other cover need protection from erosion.

5. Pacolet-Wedowee

Sloping to steep, well drained soils that have a loamy surface layer and a predominately clayey subsoil; on hillsides

The soils in this map unit are on convex hillsides. These soils mainly are in the northern part of the county. Slope is 10 to 35 percent.

This map unit makes up about 15 percent of the county. It is about 57 percent Pacolet soils, 36 percent Wedowee soils, and 7 percent soils of minor extent.

Pacolet soils mainly are eroded and commonly are on the less sloping part of the hillsides. Typically, the surface layer is yellowish red sandy clay loam about 6 inches thick. The subsoil extends to a depth of 36 inches. The upper part of the subsoil is yellowish red clay loam, the middle part is red clay that has strong brown mottles, and the lower part is red sandy clay loam that has strong brown mottles. The underlying material to a depth of 60 inches or more is red and yellowish red sandy loam formed predominately in weathered granite and gneiss.

Wedowee soils are on the steeper part of the hillsides. Typically, the surface layer is grayish brown sandy loam about 5 inches thick. The subsurface layer is yellow sandy loam 5 inches thick. The subsoil extends to a depth of about 36 inches. The upper few inches is reddish yellow sandy clay loam, the middle part is yellowish red sandy clay, and the lower part is reddish yellow and yellowish brown sandy clay loam. The underlying material to a depth of 60 inches or more is weathered gneiss and granite.

Of minor extent in this map unit are Chewacla, Congaree, and Vance soils. Somewhat poorly drained Chewacla soils and moderately well drained and well drained Congaree soils are on narrow flood plains adjacent to the upland. Well drained Vance soils are on the hillsides with the major soils.

Areas of this map unit are mostly wooded. The soils are moderately suited to this use. The soils are poorly suited to most uses because of slope. Areas without vegetative cover or other protection need protection from erosion. Gullies develop easily if the underlying material is exposed and moving water is concentrated. These limitations need to be considered if clearing and development are planned.

soils on uplands of the Sand Hills and Southern Coastal Plain

The five map units in this group are made up of well drained and moderately well drained soils, and Urban land. The very gently sloping and gently sloping soils are on medium to narrow ridgetops or short hillsides. The sloping and moderately steep soils are on short to long hillsides. These soils predominately have a brownish, sandy surface layer and a reddish or brownish, loamy or clayey subsoil. The soils in the Urban land areas have been altered by cutting, filling, or shaping. They are in business districts or are used for residential or community development.

6. Ailey-Troup-Vaucluse

Very gently sloping to moderately steep, well drained soils that have a predominately sandy surface layer and a loamy subsoil that is mostly cemented and brittle; on ridgetops and hillsides of the Sand Hills

The soils in this map unit are on convex ridgetops and hillsides. The smoother parts are on medium to narrow ridgetops. The hillsides are complex. These soils mainly are on the Fort Benning Military Reservation. Slope is 2 to 15 percent.

This unit makes up about 21 percent of the county. It is about 26 percent Ailey soils, 25 percent Troup soils, 24 percent Vaucluse soils, and 25 percent soils of minor extent.

Ailey soils have a thick surface and subsurface layer and a subsoil that is mainly cemented and brittle. Typically, the surface layer is grayish brown loamy coarse sand about 8 inches thick. The subsurface layer is light yellowish brown loamy coarse sand to a depth of 34 inches. The subsoil is sandy clay loam to a depth of 60 inches or more. The upper part of the subsoil is strong brown and has yellowish red mottles; the middle part is yellowish brown and has yellowish red and strong brown mottles; and the lower part is mottled yellowish red, yellowish brown, strong brown, and light gray. The middle and lower parts of the subsoil are cemented and brittle; they are very hard when dry.

Troup soils have a thick surface and subsurface layer and a subsoil that is friable. Typically, the surface layer is brown loamy fine sand about 4 inches thick. The subsurface layer is loamy fine sand to a depth of 48 inches. The upper part is strong brown, and the lower part is yellowish brown. The subsoil is sandy loam to a depth of 80 inches or more. The upper few inches is yellowish brown, and the rest of the subsoil is strong brown.

Vaucluse soils have a loamy surface layer and a subsoil that is mostly firm and brittle. Typically, the surface layer is grayish brown sandy loam about 6 inches thick. The subsoil is sandy clay loam to a depth of 60 inches or more. The upper part of the subsoil is strong brown; the middle part is yellowish red and has strong brown concretions; and the lower part is mottled strong brown, yellowish brown, and light gray. The middle and lower parts of the subsoil are firm and brittle.

Of minor extent in this map unit are Lakeland, Stilson, Susquehanna, and Wagram soils. The minor soils are on ridgetops and hillsides with the major soils.

Areas of this map unit are mainly wooded or idle. Some areas are used for pasture. Several large areas are used for military training facilities. Most of the soils in this map unit are moderately suited to producing forest products and poorly suited to farming. The soils are well suited to most urban uses. However, seepage from sanitary facilities commonly is a concern on the sandier parts of the map unit. The sandy surface layer needs to be considered in planning recreational development. A cemented and brittle layer is in the subsoil of some of the soils; this needs to be considered in planning certain uses. Slopes that have no vegetative cover or other protection are subject to severe gullying (fig. 2). Concentrated moving water is a potential erosion hazard for these soils.

7. Dothan-Orangeburg-Esto

Very gently sloping and gently sloping, well drained soils that have predominately a sandy surface layer and a loamy subsoil; on ridgetops and hillsides of the Southern Coastal Plain

The very gently sloping soils in this map unit are on medium convex ridgetops or at the base of hillsides, and the gently sloping soils are on narrow ridgetops and short hillsides. Much of this map unit is just south of the Southern Piedmont. Slope is 2 to 8 percent.

This map unit makes up about 9 percent of the county. It is about 48 percent Dothan soils, 31 percent Orangeburg soils, 7 percent Esto soils, and 14 percent soils of minor extent.

Dothan soils mainly are on the smoother ridgetops. Typically, the surface layer is dark brown loamy sand about 8 inches thick. The subsurface layer is dark grayish brown sandy loam to a depth of 12 inches. The subsoil is dominantly sandy clay loam to a depth of 62 inches or more. The upper part is predominately strong brown; the middle part is mainly yellowish brown and brownish yellow; and the lower part is mottled light yellowish brown, brown, strong brown, red, and light gray. Plinthite is below a depth of 50 inches and ranges from 5 to 10 percent. A few nodules of ironstone are in the surface layer and in the upper part of the subsoil.

Orangeburg soils are on ridgetops and hillsides. Typically, the surface layer is brown sandy loam about 8 inches thick. The subsoil is predominately sandy clay loam to a depth of 62 inches or more. The upper part is yellowish brown, the middle part is red, and the lower part is yellowish red and has yellowish brown mottles.

Esto soils mainly are at the base of hillsides. Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsurface layer is yellowish brown

Figure 2.—Gully erosion on the hillside and associated sediment in the foreground. This damage was the result of building site preparation in the Ailey-Troup-Vaucluse general soil map unit.

sandy loam about 4 inches thick. The subsoil extends to a depth of 62 inches or more. The upper part of the subsoil is yellowish red sandy clay that has yellowish brown mottles; the middle part is mottled strong brown, yellowish red, yellowish brown, red, and light brown clay; and the lower part is mottled light gray, red, yellowish brown, and strong brown clay.

Of minor extent in the map unit are Susquehanna, Stilson, and Troup soils. Well drained Troup soils are on the ridgetops and hillsides with the major soils. Somewhat poorly drained Susquehanna soils mainly are on toe slopes and in depressions. Moderately well drained Stilson soils are on the more depressional parts of the ridgetops, and drainage is somewhat impeded.

Areas of this map unit have a wide range of uses. A few areas are farmed. Some areas are wooded. Some are used for residential sites. Other areas are within the Fort Benning Military Reservation (fig. 3). The major soils are well suited to the more common uses; however, the Esto soils have moderate or severe limitations because of the clayey subsoil.

8. Troup-Vaucluse-Pelion

Gently sloping and sloping, well drained and moderately well drained soils that have a sandy surface layer and a loamy subsoil that is friable or mainly brittle; on hillsides of the Sand Hills

The gently sloping and sloping soils in this map unit are on short, wooded hillsides. Soil areas parallel nearby creeks and surround short laterals that branch from the main stream. Areas of these soils are within the Fort Benning Military Reservation. Slope is 5 to 15 percent.

This map unit makes up about 6 percent of the county. It is about 37 percent Troup soils, 15 percent Vaucluse soils, 15 percent Pelion soils, and 33 percent soils of minor extent.

Troup soils are near the top or middle of the slope. Typically, they have a grayish brown, loamy sand surface layer about 5 inches thick. The subsurface layer is brownish yellow loamy sand to a depth of 50 inches. The subsoil is predominately sandy clay loam to a depth of 80 inches or more. The upper part of the subsoil is yellowish brown, and the lower part is strong brown.

Vaucluse soils are on the same parts of the hillside as Troup soils. Typically, Vaucluse soils have a brown, loamy sand surface layer about 4 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of 8 inches. The subsoil is predominately sandy clay loam to a depth of 60 inches or more. The subsoil is firm, brittle, and weakly cemented below a depth of about 24 inches; it is very hard when dry. The upper part of the subsoil mainly is yellowish brown and has red and brown mottles; the middle part is yellowish red and has brown, gray, and red mottles; and the lower part is reddish yellow and has gray and yellow mottles.

Pelion soils are on the lower part of the slope and are seasonally wet. Typically, Pelion soils have a dark gray, loamy sand surface layer about 3 inches thick. The subsurface layer is pale brown loamy sand about 3

inches thick. The subsoil is predominately sandy clay loam to a depth of 60 inches or more. The upper part of the subsoil is yellowish brown and has strong brown and pale brown mottles; the middle part is yellowish brown and has light brownish gray, strong brown, and red mottles; and the lower part is mottled brown, gray, and yellow.

Of minor extent in this map unit are Ailey, Bibb, Dothan, and Wagram soils. Well drained Ailey, Dothan, and Wagram soils are on ridgetops and hillsides. Poorly drained Bibb soils are on alluvial plains along the streams.

Areas of these soils will probably remain in woodland or be used for military field exercises. The soils are moderately suited to loblolly pine and slash pine. Equipment limitations and seedling mortality are woodland management concerns. These soils are moderately suited to most sanitary facilities and building site and recreational development. Slope gradient and sandiness are concerns for the use of the upper part of the slopes. Seepage and wetness limit use of the toe slopes.

9. Urban land-Orangeburg-Esto

Urban land interspersed with gently sloping to moderately steep, well drained soils that have a loamy surface layer and a loamy or clayey subsoil; on ridgetops and hillsides of the Southern Coastal Plain

The Urban land and soils in this map unit are on narrow, gently sloping ridgetops to moderately steep hillsides. This map unit consists of residential areas to the east of the metropolitan area of Columbus, and Orangeburg and Esto soils. Much of the surface area is covered by urban development, but in places, Orangeburg and Esto soils are not covered and are in associated uses. Slope is 5 to 25 percent.

This map unit makes up about 3 percent of the county. It is 29 percent Urban land, 23 percent Orangeburg soils,

Figure 3.—Field exercises, a typical land use, at Fort Benning Military Reservation. The soil is Dothan loamy sand, 2 to 5 percent slopes, in an area of the Dothan-Orangeburg-Esto general soil map unit.

16 percent Esto soils, and 32 percent soils of minor extent.

Typically, Urban land is private dwellings, streets and sidewalks, shopping centers, parking lots, schools, and churches. The soils have been altered by grading, cutting, filling, shaping, and smoothing.

Orangeburg soils are on ridgetops. Typically, they have a brown sandy loam surface layer about 8 inches thick. The subsoil is predominately sandy clay loam to a depth of 60 inches or more. The upper few inches of the subsoil are yellowish brown, the middle part is red, and the lower part is yellowish red.

Esto soils are on hillsides. Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of 9 inches. The subsoil is predominately clay to a depth of 60 inches or more. The upper part is mainly yellowish red and has yellowish brown and red mottles, the middle part is strong brown and has gray and red mottles, and the lower part is red and has light gray mottles.

Of minor extent are the well drained Dothan and Troup soils and the excessively drained, sandy Lakeland soils. These soils are on the ridgetops and hillsides with the major soils.

The major soils vary greatly in their suitability for residential sites. The Orangeburg soils, commonly on the ridgetops, are well suited to house foundations and streets. However, the Esto soils, commonly on the hillsides, shrink and swell upon wetting and drying. In addition, Esto soils are moderately steep; thus, they erode unless protected. Smoothing, cutting, filling, and shaping are generally required for development.

10. Esto-Troup

Gently sloping to moderately steep, well drained soils that have a sandy surface layer and a clayey or loamy subsoil; on hillsides of the Sand Hills

The soils in this map unit consist of rough, wooded uplands. The soils are irregular in pattern and are highly dissected by drainage. The ridgetops are very narrow, but the hillsides are long, complex, and convex, and range to moderately steep. Areas of this map unit mainly are in the southern part of the county within the Fort Benning Military Reservation. Slope is 5 to 25 percent.

This map unit makes up about 2 percent of the county. It is about 45 percent Esto soils, 11 percent Troup soils, and 44 percent soils of minor extent.

Esto soils are on the upper and middle part of the slope. Typically, they have a dark grayish brown, loamy sand surface layer about 4 inches thick. The subsurface layer is brownish yellow loamy sand to a depth of 10 inches. The subsoil is sandy clay to a depth of 64 inches or more. The upper part is strong brown; the middle part is strong brown and has red, yellowish brown, and light gray mottles; and the lower part is red and has light gray mottles.

Troup soils mainly are on the middle and lower part of the slope. Typically, they have a grayish brown, loamy sand surface layer about 5 inches thick. The subsurface layer is brownish yellow loamy sand to a depth of 50 inches. The subsoil is predominately sandy clay loam to a depth of 80 inches or more. The upper part is yellowish brown, and the lower part is strong brown.

Of minor extent in this map unit are the well drained Ailey, Fuquay, Orangeburg, and Wagram soils, and similar soils that contain significant amounts of ironstone sheets. These soils are on the hillsides with the major soils. Narrow bands of poorly drained alluvial soils are along the small streams.

Areas of this map unit are wooded. The soils are moderately suited to producing forest products. They are poorly suited to most other uses because of slope. Land users selecting sites for development need to be aware that seepage, shrink-swell potential, sandiness, and a clay subsoil limit use in parts of each mapped area.

broad land use considerations

Deciding which land should be used for urban development is a concern in Muscogee County. Each year, a considerable amount of land is developed for urban use. In 1979, estimates indicated that about 23,500 acres, or about 17 percent of the county, was urban land. An additional 20,000 acres is committed to other nonfarm uses.

The general soil map is helpful in planning the general outline for urban areas, but it cannot be used in selecting sites for specific structures or facilities. The data about specific soils in this survey are also helpful in planning future land use. Interpretations of the general soil map for broad land use planning are specific. The following considerations, however, refer to the survey area as a whole.

Areas in which soil properties are so unfavorable that urban and recreational development is extremely limited are not extensive in the county. However, the Chewacla-Dogue map unit and the Bibb-Toccoa-Pelham map unit have soils in which flooding or wetness are severe limitations. Soils in the Pacolet-Wedowee map unit, the Esto-Troup map unit, and Esto soils in the Urban land-Orangeburg-Esto map unit are on hillsides and are poorly suited to most urban and recreational development. Slope makes development costly. Soils in the Ailey-Troup-Vaucluse map unit and the Troup-Vaucluse-Pelion map unit are moderately suited to most urban and recreational development. Seepage, wetness, sandiness, and slope limit use in most parts of these map units.

The other map units have very gently sloping and gently sloping soils that mainly are on uplands. The soils in these map units can be developed for urban and recreational uses at lower cost. These soils mainly are well drained and have a loamy or clayey subsoil. Most

are excellent farmland, and possible use for farm crops, specialty crops, or nurseries should not be overlooked in planning. In general, soils that are well suited to farming are also well suited to urban development.

Map units in the Southern Piedmont and Southern Coastal Plain contain soils that are well suited to woodland. Those map units in the Sand Hills commonly contain sandy soils that are less productive than soils in the other map units, and trees do not grow as well. Hardwood forests enhance the beauty in many areas of the Southern Piedmont. The soils provide opportunity for varied recreation development.

detailed soil map units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability of a soil for specific uses. A soil is well suited if it has properties that are favorable. A soil is moderately suited if it has properties that require special planning and management to obtain satisfactory performance. A soil is poorly suited if it has properties that are unfavorable. The descriptions and maps also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Troup loamy fine sand, 5 to 8 percent slopes, is one of several phases in the Troup series.

Some map units are made up of two or more major soils. These map units are called soil complexes or undifferentiated groups.

A *soil complex* in this survey consists of areas of a soil and urban land in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils and urban land are somewhat similar in all areas. Dothan-Urban land complex, 2 to 5 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Troup and Esto loamy sands, 5 to 15 percent slopes, is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and suitabilities for many uses. The Glossary defines many of the terms used in describing the soils.

soil descriptions

AaB—Alley loamy coarse sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on ridgetops and hillsides on uplands of the Sand Hills. Slopes are smooth and convex. Mapped areas are 10 to 200 acres.

Typically, the surface layer is dark grayish brown loamy coarse sand about 5 inches thick. The subsurface layer is light yellowish brown loamy coarse sand to a depth of 32 inches. The subsoil is sandy clay loam to a depth of 72 inches or more. The upper part of the subsoil is yellowish brown and has yellowish red and red mottles; the middle part is mottled yellowish brown and yellowish red; and the lower part is mottled yellowish brown, yellowish red, and light gray. The middle and lower parts of the subsoil are weakly cemented, firm, and brittle; these layers are very hard when dry.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid

throughout except for the surface layer in limed areas. Permeability is slow in the brittle part of the subsoil. The available water capacity is low. Tilth is good. This soil can be worked throughout a wide range of moisture content. The root zone is restricted mainly to the surface layer and the upper part of the subsoil.

Included with this soil in mapping are small areas of Dothan, Lakeland, Troup, Vaucluse, and Wagram soils.

This Ailey soil is poorly suited to farming because of the low available water capacity. However, it is moderately suited to hay and pasture. Returning crop residue to the soil increases the available water capacity and decreases the leaching of plant nutrients.

Slash pine and longleaf pine are moderately suited to this soil. Equipment limitations and seedling mortality are woodland management concerns.

This soil is well suited to most sanitary facilities and building site development. However, slow permeability in the middle and lower parts of the subsoil limits the use of this soil for septic tank absorption fields. Droughtiness is a concern if this soil is used for turf, landscaping, and vegetable gardens. This soil is moderately suited to recreational development because the thick surface and subsurface layer is too sandy.

This Ailey soil is in capability subclass IIIs and woodland suitability subclass 4s.

AaC—Ailey loamy coarse sand, 5 to 8 percent slopes. This well drained, gently sloping soil is on ridgetops and hillsides on uplands of the Sand Hills. Slopes are smooth and irregular. Mapped areas are 10 to 200 acres.

Typically, the surface layer is grayish brown loamy coarse sand about 8 inches thick. The subsurface layer is light yellowish brown loamy coarse sand to a depth of 34 inches. The subsoil is sandy clay loam to a depth of 60 inches or more. The upper part of the subsoil is strong brown and has yellowish red mottles; the middle part is yellowish brown and has yellowish red and strong brown mottles; and the lower part is mottled yellowish red, yellowish brown, strong brown, and light gray. The middle and lower parts of the subsoil are weakly cemented, compact, and brittle; they are very hard when dry.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is slow in the brittle part of the subsoil. The available water capacity is low. Tilth is good. This soil can be worked throughout a wide range of moisture content. The root zone is restricted mainly to the surface layer and the upper part of the subsoil.

Included with this soil in mapping are small areas of Dothan, Lakeland, Troup, Vaucluse, and Wagram soils.

This Ailey soil is poorly suited to farming because of the low available water capacity. However, it is moderately suited to hay and pasture. Returning crop residue to the soil increases the available water capacity and decreases the leaching of plant nutrients.

Slash pine and longleaf pine are moderately suited to this soil. Equipment limitation and seedling mortality are woodland management concerns.

This soil is well suited to most sanitary facilities and building site development. However, slow permeability in the middle and lower parts of the subsoil limits the use of this soil for septic tank absorption fields. Droughtiness is a concern if this soil is used for turf, landscaping, and vegetable gardens. This soil is moderately suited to recreational development because the thick surface and subsurface layer is too sandy.

This Ailey soil is in capability subclass IVs and woodland suitability subclass 4s.

Bh—Bibb sandy loam. This poorly drained, nearly level soil is on alluvial plains of the Southern Coastal Plain. It is frequently flooded for brief periods from early in winter to late in spring. Slopes are 0 to 2 percent. Mapped areas are 15 to 250 acres.

Typically, the surface layer is about 17 inches thick. The upper few inches is black sandy loam, and the lower part is dark gray loamy sand. The underlying material to a depth of 60 inches or more is layers of dark gray sandy loam and loamy sand.

This soil is low in natural fertility and medium in organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. The water table commonly is at a depth of less than 1.0 foot in winter and spring.

Included with this soil in mapping are a few intermingled areas of Pelham and Toccoa soils.

Loblolly pine and shortleaf pine are well suited to this Bibb soil. Wetness and flooding are limitations to equipment use in managing and harvesting the tree crop. However, operations commonly can be performed during the drier months. Drainage is needed to prevent high seedling mortality.

This soil is poorly suited to farming, sanitary facilities, and recreational development because of wetness and flooding. It is severely limited for use as building sites because of wetness and flooding. These limitations can be overcome only by extensive flood control and drainage.

This Bibb soil is in capability subclass Vw and woodland suitability subclass 2w.

CeB—Cecil sandy loam, 2 to 6 percent slopes. This well drained, very gently sloping soil is on broad ridgetops on uplands of the Southern Piedmont. Slopes are smooth and convex. Mapped areas are 5 to 60 acres or more.

Typically, the surface layer is yellowish red sandy loam about 6 inches thick. The subsoil extends to a depth of 52 inches. The upper part of the subsoil is dark brown sandy clay loam. The middle and lower parts are red and have yellowish red mottles; the middle part is clay, and the lower part is sandy clay loam. The underlying

material to a depth of 60 inches or more is mainly mottled red and yellowish red weathered granite.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good, and the soil can be worked throughout a wide range of moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Pacolet, Vance, and Wedowee soils. Soils that have a high content of mica and soils that have a red subsoil that is mottled yellow and brown are also included.

This Cecil soil is well suited to farming. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a concern if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, reduce runoff and help to control erosion.

Loblolly pine, northern red oak, and yellow-poplar are well suited to this soil. There are no significant limitations to woodland use or management.

This soil is well suited to sanitary facilities and building site and recreational development. However, moderate permeability in the subsoil limits the use of this soil for septic tank absorption fields. This limitation commonly can be overcome by increasing the size of the absorption area or modifying the filter field. The common plants used for turf, landscaping, and vegetable gardens grow well. However, there is a hazard of erosion prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This Cecil soil is in capability subclass IIe and woodland suitability subclass 3o.

CfC2—Cecil sandy clay loam, 6 to 10 percent slopes, eroded. This well drained, gently sloping soil is on ridgetops and hillsides on uplands of the Southern Piedmont. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. Slopes are mostly irregular and commonly contain rills, galled spots, and an occasional deep gully. Mapped areas are 10 to 100 acres.

Typically, the surface layer is reddish brown sandy clay loam about 5 inches thick. The upper part is mainly sandy clay, the middle part is predominately clay that has reddish yellow mottles, and the lower part is sandy clay loam that has brownish yellow mottles. The underlying material to a depth of 60 inches or more is red weathered granite that has yellow mottles.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeabilty is moderate, and the available water capacity is medium. Tilth is fair. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Pacolet, Vance, and Wedowee soils. Soils that have a high content of mica and soils that have a dark red subsoil are also included.

This Cecil soil is moderately suited to farming. Tilth can be improved by returning crop residue to the soil. Erosion is a concern if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, reduce runoff and help to control erosion.

Loblolly pine, northern red oak, and yellow-poplar are well suited to this soil. There are no significant limitations to woodland use or management.

This soil is moderately suited to sanitary facilities and building site and recreational development because of slope. Moderate permeability in the subsoil limits the use of this soil for septic tank abrorption fields. The common plants used for turf, landscaping, and vegetable gardens grow well. However, the hazard of erosion is severe prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This Cecil soil is in capability subclass IVe and woodland suitability subclass 4c.

Ch—Chastain loam. This poorly drained, nearly level soil is on alluvial plains of the Southern Coastal Plain. This soil is occasionally flooded for very long periods from early in winter to the middle of spring. Mapped areas are 10 to 100 acres. Slopes are less than 1 percent.

Typically, the surface layer is brown loam about 4 inches thick. The subsoil extends to a depth of about 46 inches. It is gray and light gray and has mainly strong brown mottles. The upper part of the subsoil is silty clay loam, the middle part is silty clay, and the lower part is clay. The underlying material to a depth of 60 inches or more is gray clay that has olive mottles.

This soil is medium in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is slow, and the available water capacity is high. Tilth is fair. The water table commonly is at a depth of less than 1.0 foot from late in fall to late in spring.

Included with this soil in mapping are small areas of Chewacla and Susquehanna soils.

This Chastain soil is poorly suited to farming because of flooding and wetness. However, it is moderately suited to pasture.

Loblolly pine is well suited to this soil. Wetness and flooding limit the use of equipment for managing and harvesting tree crops. However, operations can be successfully performed during the drier seasons. Drainage is needed to prevent high seedling mortality.

This soil is poorly suited to sanitary facilities and recreational development because of wetness and flooding. It is severely limited for use as building sites because of wetness and flooding. These limitations can

be overcome only by extensive flood control and drainage.

This Chastain soil is in capability subclass IVw and woodland suitability subclass 2w.

Ck—Chewacla loam. This somewhat poorly drained, nearly level soil is on alluvial plains of the Southern Piedmont and Southern Coastal Plain. This soil is occasionally flooded for brief periods from late in fall to the middle of spring. Slope is 0 to 2 percent. Mapped areas are 10 to 300 acres.

Typically, the surface layer is dark brown loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. The upper few inches are reddish brown sandy clay loam that has grayish brown mottles; the middle part is grayish brown and yellowish brown sandy clay loam that has strong brown, yellowish brown, and light brownish gray mottles; and the lower part is mottled yellowish brown, light brownish gray, and strong brown clay loam.

This soil is medium in natural fertility and organic matter content. It is strongly acid or medium acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is high. Tilth is good. The water table commonly is at a depth of less than 1.5 feet from late in fall to the middle of spring.

Included with this soil in mapping are small areas of Chastain and Toccoa soils.

This Chewacla soil is moderately suited to farming because of flooding and wetness.

Loblolly pine and yellow-poplar are well suited to this soil. Wetness and flooding limit the use of equipment for managing and harvesting tree crops. However, operations can be successfully performed during the drier seasons. Drainage is needed to prevent high seedling mortality.

This soil is poorly suited to sanitary facilities and recreational development because of wetness and flooding. It is severely limited for use as building sites because of wetness and flooding. These limitations can be overcome only by extensive flood control and drainage.

This Chewacla soil is in capability subclass IIIw and woodland suitability subclass 1w.

Cn—Congaree loam. This well drained or moderately well drained, nearly level soil is on alluvial plains of the Southern Piedmont and Southern Coastal Plain. Slope is 0 to 2 percent. Mapped areas are 5 to 200 acres.

Typically, the surface layer is reddish brown loam about 10 inches thick. The underlying brownish material is stratified or has bedding planes to a depth of 60 inches or more. The upper layers are loam, and the lower layer is fine sandy loam.

This soil is low in natural fertility and organic matter content. It is slightly acid or medium acid throughout. Permeability is moderate, and the available water capacity is medium. Tilth is good. The water table commonly is at a depth of 2.5 to 4.0 feet from late in fall to the middle of spring.

Included with this soil in mapping are areas of Chewacla and Masada soils.

This Congaree soil is well suited to farming. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, help to increase organic matter content in the soil.

Loblolly pine and yellow-poplar are well suited to this soil. There are no significant limitations to woodland use or management.

This soil is poorly suited to sanitary facilities because of seasonal wetness. It is well suited to recreational and most building site development.

This Congaree soil is in capability subclass IIw and woodland suitability subclass 1o.

DgA—Dogue loam, 1 to 2 percent slopes. This moderately well drained, nearly level soil is on stream terraces slightly downstream from the uplands of the Southern Piedmont. Dogue soils are on stream terraces between soils on the lower lying flood plain and soils on uplands of the Southern Coastal Plain. Mapped areas are 10 to 100 acres.

Typically, the surface layer is brown loam about 5 inches thick. The subsoil is clay to a depth of 60 inches or more. The upper few inches is predominately yellowish brown, and the rest of the subsoil is mottled brownish, yellowish, grayish, and red.

This soil is low in natural fertility and organic matter content. It is slightly acid to strongly acid throughout. Permeability is moderately slow, and the available water capacity is medium. This soil has good tilth. The water table commonly is at a depth of 2.0 to 3.0 feet in winter and early in spring.

Included with this soil in mapping are small areas of Esto, Masada, and Susquehanna soils.

This Dogue soil is well suited to farming. Use, however, is somewhat limited because of wetness. Ditches commonly help to overcome this limitation. Good tilth is easily maintained by returning crop residue to the soil. In addition, conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, help to increase organic matter content in the soil.

Loblolly pine is well suited to this soil. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. However, operations can be successfully performed during the drier seasons.

This soil is moderately suited to most sanitary facilities and building site and recreational development. Moderately slow permeability in the subsoil limits the use of this soil for septic tank absorption fields. Shrink-swell potential of the subsoil needs to be considered in selecting building sites. Wetness commonly can be overcome by drainage.

This Dogue soil is in capability subclass IIw and woodland suitability subclass 2w.

DoB—Dothan loamy sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on ridgetops and hillsides on uplands of the Southern Coastal Plain. Slopes commonly are smooth and convex. Mapped areas are 5 to 90 acres.

Typically, the surface layer is dark brown loamy sand about 8 inches thick. The subsurface layer is dark grayish brown sandy loam to a depth of 12 inches. The subsoil is dominantly sandy clay loam to a depth of 62 inches or more. The upper part is predominately strong brown; the middle part is mainly yellowish brown and brownish yellow; and the the lower part is mottled light yellowish brown, brown, strong brown, red, and light gray. Plinthite is below a depth of 50 inches and ranges from 5 to 10 percent. A few nodules of ironstone are in the surface layer and in the upper part of the subsoil.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is medium. Tilth is good. This soil can be worked throughout a wide range of moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Ailey, Orangeburg, and Wagram soils. Also included are a few small areas of soil that has a clayey subsoil.

This Dothan soil is well suited to farming. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a concern if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, reduce runoff and help to control erosion.

Loblolly pine and slash pine are well suited to this soil. There are no significant limitations to woodland use or management.

This soil is moderately suited to most sanitary facilities because of seasonal wetness. Moderately slow permeability in the lower part of the subsoil limits the use of this soil for septic tank absorption fields. In most places, this limitation can be overcome by increasing the size of the absorption area or modifying the design of the field. This soil is well suited to most building site and recreational development. The common plants used for turf, landscaping, and vegetable gardens grow well. However, there is a hazard of erosion prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This Dothan soil is in capability subclass IIe and woodland suitability subclass 2o.

DoC—Dothan loamy sand, 5 to 8 percent slopes. This well drained, gently sloping soil is on hillsides on uplands of the Southern Coastal Plain. Slopes are mostly smooth and convex. Mapped areas are 5 to 30 acres.

Typically, the surface layer is brown loamy sand about 8 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of about 18 inches. The subsoil is predominately sandy clay loam to a depth of 65 inches or more. The upper part is yellowish brown and has brownish yellow mottles; the middle part is mottled yellowish brown, red, strong brown, and light yellowish brown; and the lower part is mottled strong brown, yellowish brown, red, and light gray. Plinthite is below a depth of about 37 inches and ranges from 5 to 15 percent in the lower part of the subsoil. Nodules of ironstone are in the soil to a depth of about 45 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is medium. Tilth is good. This soil can be worked throughout a wide range of moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Ailey, Orangeburg, and Wagram soils.

This Dothan soil is well suited to farming. However, erosion is a concern. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, reduce runoff and help to control erosion. Good tilth is easily maintained by returning crop residue to the soil.

Loblolly pine and slash pine are well suited to this soil. There are no significant limitations to woodland use or management.

This soil is moderately suited to most sanitary facilities because of seasonal wetness. Moderately slow permeability in the lower part of the subsoil limits the use of this soil for septic tank absorption fields. In most places, this limitation can be overcome by increasing the size of the absorption area or modifying the design of the field. This soil is well suited to most building site and recreational development. The common plants used for turf, landscaping, and vegetable gardens grow well. However, there is a severe hazard of erosion prior to establishing permanent plant over. Tillage operations across the slope and winter cover crops help to control erosion.

This Dothan soil is in capability subclass IIIe and woodland suitability subclass 2o.

DuB—Dothan-Urban land complex, 2 to 5 percent slopes. This complex consists of areas of well drained Dothan soil and Urban land so intermingled that they could not be mapped separately at the scale selected. This very gently sloping complex is on ridgetops on uplands of the Southern Coastal Plain. Mapped areas are 20 to 300 acres.

Dothan soil makes up about 55 percent of the complex. Typically, the Dothan soil has a surface layer of brown loamy sand about 8 inches thick. The subsoil is predominately sandy clay loam to a depth of 60 inches or more. The upper part of the subsoil is strong brown;

the middle part is yellowish brown and brownish yellow; and the lower part is mottled brown, gray, and red and is 5 to 10 percent plinthite. A few nodules of ironstone are in the surface layer and in the upper part of the subsoil.

Dothan soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is medium. Tilth is good. This soil can be worked throughout a wide range of moisture content. The root zone is easily penetrated by plant roots.

Urban land makes up about 40 percent of the complex. It is private dwellings, industrial sites, streets and sidewalks, shopping centers, parking lots, schools, and chruches. The soils have been altered by grading, cutting, filling, shaping, and smoothing.

Included in mapping are a few gently sloping and sloping Dothan soils and Urban land. Several clustered areas that are predominantly Urban land are also included in mapping.

The Dothan soil is moderately suited to most sanitary facilities because of wetness. Moderately slow permeability in the lower part of the subsoil limits the use of this soil for septic tank absorption fields. In most places, this limitation can be overcome by increasing the size of the absorption area or modifying the design of the field. This soil is well suited to most building site and recreational development. The common plants used for turf, landscaping, and vegetable gardens grow well. However, there is a hazard of erosion prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This complex is not assigned to a capability subclass or woodland suitability subclass.

EmB—Esto sandy loam, 2 to 5 percent slopes. This well drained, very gently sloping soil is mainly at the base of hillsides on uplands of the Southern Coastal Plain. Slopes commonly are smooth and convex. Mapped areas are 5 to 25 acres.

Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsurface layer is yellowish brown sandy loam about 4 inches thick. The subsoil extends to a depth of 62 inches or more. The upper part is yellowish red sandy clay that has yellowish brown mottles; the middle part is mottled strong brown, yellowish red, yellowish brown, red, and light brown clay; and the lower part is mottled light gray, red, yellowish brown, and strong brown clay.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is slow and the available water capacity is medium. Tilth is good. The root zone is deep.

Included with this soil in mapping are small areas of Dothan and Orangeburg soils.

This Esto soil is moderately suited to farming. Erosion is a concern if cultivated crops are grown because of the slowly permeable subsoil. Good tilth can be maintained in most places by returning crop residue to the soil. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, reduce runoff and help to control erosion.

Loblolly pine is moderately suited to this soil (fig. 4). There are no significant limitations to woodland use or management.

This soil is moderately suited to most sanitary facilities and building site and recreational development. Slow permeability in the subsoil limits the use of this soil for septic tank absorption fields and many recreational uses. Shrink-swell potential of the subsoil needs to be considered in selecting building sites. The clayey subsoil is a limitation for trench type sanitary landfills.

This Esto soil is in capability subclass IIIe and woodland suitability subclass 3o.

EnE—Esto-Urban land complex, 8 to 25 percent slopes. This complex consists of areas of well drained Esto soil and Urban land so intermingled that they could not be mapped separately at the scale selected. This sloping or moderately steep complex is on hillsides on uplands of the Southern Coastal Plain. Mapped areas are 20 to 200 acres.

Esto soil makes up about 55 percent of the complex. Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of 9 inches. The subsoil is predominately clay to a depth of 60 inches or more. The upper part is mainly yellowish red and has yellowish brown and red mottles, the middle part is strong brown and has gray and red mottles, and the lower part is red and has light gray mottles.

Esto soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is medium. Tilth is good. The root zone is deep.

Urban land makes up about 40 percent of each mapped area. It is private dwellings, industrial sites, streets and sidewalks, shopping centers, parking lots, schools, and churches. The soils have been altered by grading, cutting, filling, shaping, and smoothing.

The Esto soil is poorly suited to sanitary facilities and building site and recreational development because of slope.

This complex is not assigned to a capability subclass or woodland suitability subclass.

EOD—Esto, Fuquay, and Alley loamy sands, 5 to 12 percent slopes. This map unit consists of well drained, gently sloping and sloping soils on wooded hillsides on uplands of the Sand Hills. The soils parallel nearby streams or surround short lateral drainageways. Most mapped areas have two or more of the soils, but in a few areas only one is present. There is no regular

Figure 4.—Loblolly pine in an area of Fort Benning Military Reservation. The soil is Esto sandy loam, 2 to 5 percent slopes, in an area of the Dothan-Orangeburg-Esto general soil map unit.

pattern. Although the composition of this map unit is variable, mapping has been controlled well enough to be interpreted for the present and predicted use of the soils. A typical mapped area is about 40 percent Esto soils, 20 percent Fuquay soils, and 15 percent Ailey soils; however, the proportion of each varies significantly from one mapped area to another. Esto soils are near the upper part of the hillside. Fuquay and Ailey soils are mainly on the middle or lower part of the hillside but in places are on ridgetops. Slopes commonly are convex and complex. Mapped areas are 10 to 160 acres.

Typically, Esto soils have a dark grayish brown, loamy sand surface layer about 4 inches thick. The subsurface layer is brownish yellow loamy sand to a depth of 10 inches. The subsoil is sandy clay to a depth of 64 inches or more. The upper part of the subsoil is strong brown; the middle part is strong brown and has red, yellowish brown, and light gray mottles; and the lower part is red and has light gray mottles.

Esto soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is medium. Tilth is good. The root zone is deep.

Typically, Fuquay soils have a dark grayish brown, loamy sand surface layer about 7 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of 26 inches. The subsoil is predominately yellowish brown sandy clay loam to a depth of 80 inches or more. Plinthite makes up about 10 percent of the subsoil below a depth of about 45 inches. Nodules of ironstone are in the surface layer and much of the subsoil.

Fuquay soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout. Permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is medium. Tilth is good. The root zone is deep.

Typically, Ailey soils have a dark grayish brown, loamy sand surface layer about 7 inches thick. The subsurface layer is light yellowish brown loamy sand to a depth of 24 inches. The subsoil is predominately sandy clay loam to a depth of 80 inches or more. The upper part of the subsoil is yellowish brown and has yellowish red mottles. The lower part is mottled red, brown, yellow, and gray. The lower part is firm, brittle, and weakly cemented; it is very hard when dry.

Ailey soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout. Permeability is rapid in the surface layer and subsurface layer and slow in the weakly cemented subsoil layer. The available water capacity is medium. Tilth is good. The root zone is restricted mainly to the surface layer and upper part of the subsoil.

Included with these soils in mapping are small areas of Troup and Wagram soils. Colluvial soils in depressions and soils that have significant amounts of ironstone are also included.

Loblolly pine and slash pine are moderately suited to these soils. Equipment limitations and seedling mortality are woodland management concerns on the sandier parts.

These soils are poorly suited to farming because of slope. Also, parts of most mapped areas have a severe erosion hazard, and the sandier parts have low available water capacity. These soils are moderately suited to most sanitary facilities and building site and recreational development. The shrink-swell potential, clayey subsoil, sandiness, and slope are limitations to land use in parts of most mapped areas.

The capability subclass is VIe for the Esto soils, IIIs for the Fuquay soils, and VIIe for the Ailey soils. The woodland suitability subclass is 3o for the Esto soils, 3s for the Fuquay soils, and 4s for the Ailey soils.

EPE—Esto and Troup loamy sands, 12 to 25 percent slopes. This map unit consists of well drained, sloping and moderately steep soils on wooded hillsides on uplands of the Sand Hills. Soil areas parallel nearby streams or surround short lateral drainageways. Mapped areas have one or both of these soils; there is no regular pattern. Although the composition of this map unit is variable, mapping has been controlled well enough to be interpreted for the present and predicted use of the soils. A typical mapped area is about 45 percent Esto soils and 15 percent Troup soils. However, the proportion varies significantly from one mapped area to another. Esto soils are near the upper or middle part of the hillside, and Troup soils are on the lower part. Slopes commonly are convex and complex. Mapped areas are 10 to 160 acres.

Typically, the Esto soils have a dark grayish brown, loamy sand surface layer about 4 inches thick. The subsurface layer is brownish yellow loamy sand to a depth of 10 inches. The subsoil is sandy clay to a depth of 64 inches or more. The upper part of the subsoil is strong brown; the middle part is strong brown and has red, yellowish brown, and light gray mottles; and the lower part is red and has light gray mottles.

Esto soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is medium. Tilth is good. The root zone is deep.

Typically, Troup soils have a grayish brown, loamy sand surface layer about 5 inches thick. The subsurface layer is brownish yellow loamy sand to a depth of 50 inches. The subsoil is predominately sandy clay loam to a depth of 80 inches or more. The upper part of the subsoil is yellowish brown, and the lower part is strong brown.

Troup soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout. Permeability is rapid in the surface layer and subsurface layer and moderate in the subsoil. The available water capacity is low. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with these soils in mapping are small areas of Orangeburg soils, soils that are clayey and contain kaolin balls, and loamy soils that contain significant nodules of ironstone. Also included are seasonally wet, sandy, colluvial soils in depressions and on toe slopes.

Loblolly pine and slash pine are moderately suited to these soils. Equipment limitations and seedling mortality are woodland management concerns on the sandier parts.

These soils are poorly suited to most uses because of slope. In addition, seepage, shrink-swell potential, sandiness, and the clayey subsoil limit use in parts of each mapped area.

The capability subclass is VIe for the Esto soils and VIIs for the Troup soils. The woodland suitability subclass is 3o for the Esto soils and 3s for the Troup soils.

EtA—Eunola sandy loam, 0 to 3 percent slopes. This moderately well drained, nearly level and very gently sloping soil is on low lying stream terraces of the Southern Coastal Plain. This soil is rarely flooded for very brief periods from winter to the middle of spring. Slopes are smooth and slightly concave. Mapped areas are 10 to 50 acres.

Typically, the surface layer is dark grayish brown sandy loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part is very pale brown sandy loam; the middle part is mainly yellowish brown sandy clay loam that has brown, red, and gray mottles; and the lower part is mottled yellowish brown, light gray, yellowish red, and strong brown sandy loam.

The soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. The water table is at a depth of 1.5 to 2.5 feet from late in fall to late in winter.

Included with this soil in mapping are small areas of Dothan, Troup, and Wagram soils.

This Eunola soil is well suited to farming. However, use is somewhat limited because of wetness. Drainage will help to overcome this limitation. Good tilth is easily maintained by returning crop residue to the soil. In addition, conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, increase organic matter content in the soil.

Loblolly pine is well suited to this soil. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. However, operations can be successfully performed in the drier seasons. Also, seedling mortality is a management concern that could be overcome by drainage.

This soil is poorly suited to sanitary facilities and moderately suited to most building site and recreational development because of seasonal wetness. However, in most places, this can be somewhat overcome by drainage.

This Eunola soil is in capability subclass IIw and woodland suitability subclass 2w.

EuA—Eunola-Urban land complex, 0 to 3 percent slopes. This complex consists of areas of moderately well drained Eunola soil and Urban land so intermingled that they could not be mapped separately at the scale selected. This nearly level and very gently sloping complex is on stream terraces of the Southern Coastal Plain, mainly near Upatoi Creek. It is rarely flooded for very brief periods from winter to the middle of spring. Mapped areas are 10 to 300 acres.

Eunola sandy loam makes up about 55 percent of the complex. Typically, the surface layer is dark grayish brown sandy loam about 9 inches thick. The subsoil is predominately sandy clay loam to a depth of 60 inches or more. The upper part is very pale brown; the middle part is yellowish brown and has strong brown, red, and light gray mottles; and the lower part is mottled yellowish brown, strong brown, yellowish red, and light gray.

Eunola soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. The water table is at a depth of 1.5 to 2.5 feet from late in fall to late in winter.

Urban land makes up about 40 percent of each mapped area. It is private dwellings, industrial sites, streets, sidewalks, shopping centers, parking lots, churches, and schools. The soils have been altered by grading, cutting, filling, shaping, and smoothing.

The Eunola soil is poorly suited to sanitary facilities and moderately suited to most building site and recreational development because of seasonal wetness. However, in most places, this can be somewhat overcome by drainage. The common plants used for turf, landscaping, and vegetable gardens grow well.

This complex is not assigned to a capability subclass or woodland suitability subclass.

HsB—Hiwassee loam, 2 to 6 percent slopes. This well drained, very gently sloping soil is on broad ridgetops on uplands of the Southern Piedmont. Slopes are smooth and convex. Mapped areas are 10 to 60 acres.

Typically, the surface layer is dark reddish brown loam about 7 inches thick. The subsoil extends to a depth of 62 inches or more. The upper part is dark reddish brown clay loam, the middle part is dark red clay, and the lower part is red sandy clay loam.

This soil is medium in natural fertility and low in organic matter content. It is medium acid or strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. This soil has good tilth. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Cecil and Pacolet soils. Also included are small areas of Vance soils.

Most areas of this soil are wooded; a few areas are in pasture.

This Hiwassee soil is well suited to farming. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a concern if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, reduce runoff and help to control erosion.

Loblolly pine and yellow-poplar are well suited to this soil. There are no significant limitations for woodland use and management.

This soil is well suited to sanitary facilities and building site and recreational development. However, moderate permeability in the subsoil somewhat limits the use of this soil for septic tank absorption fields. This limitation commonly can be overcome by increasing the size of the absorption area or modifying the filter field. The common plants used for turf, landscaping, and vegetable gardens grow well. However, there is a hazard of erosion prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This Hiwassee soil is in capability subclass IIe and woodland suitability subclass 3o.

Hy—Hydraquents, loamy. These very poorly drained, nearly level soils are in low areas, in old stream meanders at the base of escarpments, in depressions, and on flood plains of Upatoi Creek. Mapped areas are irregular in shape and range from about 40 acres to 100 acres. Hydraquents are flooded or ponded for very long periods throughout the year. They are ponded to a depth of 1 foot to 6 feet in most areas.

Typically, Hydraquents have strata of grayish brown silt loam and greenish gray silty clay loam to a depth of 40 inches or more.

Included with Hydraquents in mapping are small areas of Chastain and Bibb soils.

Areas of Hydraquents are sparsely wooded with water tupelo, cypress, blackgum, black willow, and a few swamp maple. Also, many water-tolerant shrubs and aquatic plants are present.

These soils are poorly suited to most uses because of flooding, wetness, and low strength. These limitations can be overcome only by extensive flood control and drainage.

These soils are well suited to wetland plants and to developing shallow water areas for wetland wildlife (fig. 5). Ducks, fish, and crayfish are common.

Hydraquents is in capability subclass VIIIw and woodland suitability subclass 3w.

LaC—Lakeland sand, 5 to 10 percent slopes. This excessively drained, gently sloping and sloping soil is on ridgetops and hillsides on uplands of the Sand Hills. Slopes are smooth and convex. Mapped areas are 20 to 100 acres.

Typically, the soil is sand throughout. The surface layer is very dark grayish brown and about 4 inches thick. The underlying material to a depth of 80 inches or more is strong brown, yellowish brown, and light yellowish brown.

Figure 5.—An area of Hydraquents, loamy, that is well suited to habitat for wetland wildlife.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is very rapid, and the available water capacity is low. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Ailey, Troup, Vaucluse, and Wagram soils.

This Lakeland soil is poorly suited to farming because of slope and low available water capacity. Returning crop residue to the soil helps to somewhat overcome these limitations.

Loblolly pine and longleaf pine are moderately suited to this soil. Equipment limitations and seedling mortality are woodland management concerns.

This soil is poorly suited to sanitary facilities because of seepage. Also, the soil is too sandy and is poorly suited to recreational development. This soil is well suited to building site development. However, droughtiness is a concern in establishing and maintaining turf, landscape plants, and vegetable gardens.

This Lakeland soil is in capability subclass VIs and woodland suitability subclass 4s.

LaE—Lakeland sand, 10 to 25 percent slopes. This excessively drained, sloping and moderately steep soil is on ridgetops and hillsides on uplands of the Sand Hills. Slopes are smooth and convex. Mapped areas are 20 to 200 acres.

Typically, the soil is sand throughout. The surface layer is brown and about 7 inches thick. The underlying material to a depth of 80 inches or more is pale brown in the upper part and mainly yellowish brown in the lower part.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is very rapid, and the available water capacity is low. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Ailey, Troup, Vaucluse, and Wagram soils.

Loblolly pine and longleaf pine are moderately suited to this soil. Equipment limitations and seedling mortality are woodland management concerns.

This soil is poorly suited to farming, sanitary facilities, and building site and recreational development. Slope is a limitation for most uses. This soil is too sandy for many recreational uses, and seepage is a limitation for sanitary facilities.

This Lakeland soil is in capability subclass VIIs and woodland suitability subclass 4s.

MaA—Masada fine sandy loam, 0 to 3 percent slopes. This well drained, nearly level and very gently sloping soil is on stream terraces near the larger creeks and rivers. These soils commonly are between soils on the lower lying flood plain and soils on uplands of the higher lying Southern Piedmont and Southern Coastal Plain. Mapped areas are 10 to 60 acres.

Typically, the surface layer is brown fine sandy loam about 3 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 10 inches. The subsoil extends to a depth of about 54 inches. The upper part of the subsoil is strong brown sandy clay loam, the middle part is yellowish red sandy clay and clay that has yellowish brown mottles, and the lower part is strong brown clay loam that has dark yellowish brown mottles. The underlying material to a depth of 60 inches or more is strong brown sandy loam.

This soil is low in natural fertility and organic matter content. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Chewacla, Dogue, and Toccoa soils. A few intermingled areas of Wickham soils are also included.

This Masada soil is well suited to farming. Good tilth is easily maintained by returning crop residue to the soil. In addition, conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, help to conserve moisture and maintain organic matter content.

Loblolly pine and yellow-poplar are well suited to this soil. There are no significant limitations to woodland use or management.

This soil is well suited to sanitary facilities and building site and recreational development. However, moderate permeability in the subsoil somewhat limits the use of this soil for septic tank absorption fields. This limitation commonly can be overcome by increasing the size of the absorption area or modifying the filter field. Shrink-swell potential of the subsoil needs to be considered in selecting building sites. The common plants used for turf, landscaping, and vegetable gardens grow well.

This Masada soil is in capability class I and woodland suitability subclass 3o.

MuA—Masada-Urban land complex, 0 to 3 percent slopes. This complex consists of areas of well drained Masada soil and Urban land so intermingled that they could not be mapped separately at the scale selected. This nearly level and very gently sloping complex is on stream terraces near the larger creeks and rivers of the Southern Piedmont and the Southern Coastal Plain. Mapped areas are 20 to 100 acres.

Masada soils make up about 55 percent of the complex. Typically, Masada soils have a brown, fine sandy loam surface layer about 3 inches thick. The subsurface layer is yellowish brown fine sandy loam about 7 inches thick. The subsoil dominantly is clay to a depth of 60 inches or more. The upper few inches of the subsoil is strong brown, the middle part is yellowish red, and the lower part is strong brown.

Masada soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. These soils can be worked throughout a wide range of moisture content. The root zone is easily penetrated by plant roots.

Urban land makes up about 40 percent of each mapped area. It is private dwellings, industrial sites, streets and sidewalks, shopping centers, parking lots, schools, and churches. The soils have been altered by grading, cutting, filling, shaping, and smoothing.

The Masada soil is well suited to sanitary facilities and building site and recreational development. However, moderate permeability in the subsoil somewhat limits the use of this soil for septic tank absorption fields. This limitation commonly can be overcome by increasing the size of the absorption area or modifying the filter field. Shrink-swell potential of the subsoil needs to be considered in selecting building sites. The common plants used for turf, landscaping, and vegetable gardens grow well.

This complex is not assigned to a capability subclass or woodland suitability subclass.

OrB—Orangeburg loamy sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on ridgetops and hillsides on uplands of the Southern Coastal Plain. Slopes are smooth and convex. Mapped areas are 5 to 90 acres.

Typically, the surface layer is brown loamy sand about 6 inches thick. The subsoil is predominately sandy clay loam to a depth of 60 inches or more. The upper part is yellowish red, and the rest of the subsoil is red and yellowish red which is mottled brown and red in the lower part.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. This soil can be worked throughout a wide range of moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Dothan, Esto, and Troup soils. Also included are a few areas of soils that have a dark red subsoil and a few areas of soils that have shallow gullies.

This Orangeburg soil is well suited to farming. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a concern if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, reduce runoff and help to control erosion.

Loblolly pine is well suited to this soil. There are no significant limitations to woodland use or management.

This soil is well suited to sanitary facilities and building site and recreational development. The common plants used for turf, landscaping, and vegetable gardens grow well. However, there is a hazard of erosion prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This Orangeburg soil is in capability subclass IIe and woodland suitability subclass 2o.

OrC—Orangeburg loamy sand, 5 to 8 percent slopes. This well drained, gently sloping soil is on hillsides on uplands of the Southern Coastal Plain. Slopes are smooth and convex. Mapped areas are 5 to 30 acres.

Typically, the surface layer is brown sandy loam about 8 inches thick. The subsoil is predominately sandy clay loam to a depth of 62 inches or more. The upper part is yellowish brown, the middle part is red, and the lower part is yellowish red and has yellowish brown mottles.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Dothan, Esto, and Troup soils. A few areas of soils that have a dark red subsoil and soils that have a few shallow gullies also are included.

This Orangeburg soil is well suited to farming. However, erosion is a concern. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, reduce runoff and help to control erosion. Good tilth is easily maintained by returning crop residue to the soil.

Loblolly pine is well suited to this soil. There are no significant limitations to woodland use or management.

This soil is well suited to most sanitary facilities and building site and recreational development. The common plants used for turf, landscaping, and vegetable gardens grow well. However, there is a severe hazard of erosion prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This Orangeburg soil is in capability subclass IIIe and woodland suitability subclass 2o.

OuC—Orangeburg-Urban land complex, 2 to 8 percent slopes. This complex consists of areas of well drained Orangeburg soil and Urban land so intermingled they could not be mapped separately at the scale selected. This very gently sloping and gently sloping complex is on ridgetops on uplands of the Southern Coastal Plain. Mapped areas are 20 to 300 acres.

Orangeburg soil makes up about 55 percent of the complex. Typically, the surface layer is brown sandy loam about 8 inches thick. The subsoil is predominately sandy clay loam to a depth of 60 inches or more. The upper few inches of the subsoil is yellowish brown, the middle part is red, and the lower part is yellowish red.

Orangeburg soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. These soils can be worked throughout a wide range of moisture content. The root zone is easily penetrated by plant roots.

Urban land makes up about 40 percent of each mapped area. It is private dwellings, industrial sites, streets and sidewalks, shopping centers, parking lots, schools, and churches. The soils have been altered by grading, cutting, filling, shaping, and smoothing.

This Orangeburg soil is well suited to most sanitary facilities and building site and recreational development (fig. 6). The common plants used for turf, landscaping, and vegetable gardens grow well. However, there is a severe hazard of erosion on the steeper part of the soil prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This complex is not assigned to a capability subclass or woodland suitability subclass.

PfE—Pacolet sandy loam, 15 to 25 percent slopes. This well drained, moderately steep soil is on hillsides on uplands of the Southern Piedmont. Slopes commonly are long, smooth, and convex. Mapped areas are 10 to 100 acres.

Typically, the surface layer is very dark gray sandy loam about 3 inches thick. The subsurface layer is yellowish brown sandy loam about 4 inches thick. The subsoil extends to a depth of 24 inches. The upper part of the subsoil is yellowish red sandy clay loam, the middle part is red clay, and the lower part is red sandy clay. The underlying material to a depth of 60 inches or more is red sandy loam that is mottled reddish yellow.

This soil is low in natural fertility and organic matter content. It is medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Wedowee soils and areas that have many stones and

Figure 6.—A playground in an area of Orangeburg-Urban land complex, 2 to 8 percent slopes. Orangeburg soils are well suited to most recreational development. They are easily modified, if necessary, for intensive play areas.

boulders on the surface. Also included are small areas of soils that have a high content of mica. Areas of rock outcrop are included. These are indicated by a rock outcrop symbol on the map. Also included are a few intermingled areas of a soil that has less clay in the subsoil than is common to the Pacolet soils.

Loblolly pine and yellow-poplar are only moderately suited to this Pacolet soil. The hazard of erosion and equipment limitations are woodland management concerns.

This soil is poorly suited to farming, sanitary facilities, and building site and recreational development because of slope. There is a severe hazard of erosion prior to establishing permanent plant cover.

This Pacolet soil is in capability subclass VIe and woodland suitability subclass 3r.

PgC2—Pacolet sandy clay loam, 6 to 10 percent slopes, eroded. This well drained, gently sloping soil is on narrow ridgetops and short hillsides on uplands of the Southern Piedmont. The surface layer is a mixture of part of the original surface soil and the upper part of the subsoil. Slopes are convex and contain rills or galled spots, shallow gullies, and an occasional deep gully. Mapped areas are 5 to 25 acres.

Typically, the surface layer is reddish brown sandy clay loam about 1 inch thick. The subsoil is red and extends to a depth of about 35 inches. The upper few inches is clay loam, the middle part is clay, and the lower part is clay loam. The underlying material is predominately weathered granite and gneiss to a depth of 60 inches or more.

This soil is low in natural fertility and organic matter content. It is medium acid to very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is only fair because of the high clay content in the surface layer. Runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Cecil, Vance, and Wedowee soils. Also included are a few areas of a soil that has a high content of mica and a few less eroded areas. In places, many stones and boulders are on the surface. Areas of rock outcrop are included. These are indicated by a rock outcrop symbol on the map. A few rock outcrops that were not observed in mapping can be expected.

This Pacolet soil is poorly suited to farming because of slope and the eroded surface layer. However, satisfactory yields of hay and pasture can be obtained if good management is used.

Loblolly pine and yellow-poplar are moderately suited to this soil. The hazard of erosion, equipment limitations, and seedling mortality are woodland management concerns. These concerns can be overcome to some extent by good management.

This soil is only moderately suited to most sanitary facilities and building site and recreational development mainly because of slope. There is a severe hazard of erosion prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This Pacolet soil is in capability subclass IVe and woodland suitability subclass 4c.

PgD2—Pacolet sandy clay loam, 10 to 15 percent slopes, eroded. This well drained, sloping soil is on hillsides on uplands of the Southern Piedmont. The surface layer is a mixture of part of the original surface soil and the upper part of the subsoil. Slopes are short and convex and contain rills, galled spots, shallow gullies, and an occasional deep gully. Mapped areas are 20 to 200 acres.

Typically, the surface layer is yellowish red sandy clay loam about 6 inches thick. The subsoil extends to a depth of 36 inches. The upper part is yellowish red clay loam, the middle part is red clay that has strong brown mottles, and the lower part is red sandy clay loam that has strong brown mottles. The underlying material to a depth of 60 inches or more is red and yellowish red sandy loam weathered from granite gneiss.

This soil is low in natural fertility and organic matter content. It is medium acid to very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is poor because of the high clay content in the surface layer. Runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Cecil, Vance, and Wedowee soils. Also included are a few less eroded soils. Soil areas that have large stones and boulders on the surface and areas of soil that have a high content of mica also are included. Areas of rock outcrop are included. These are indicated by a rock outcrop symbol on the map. A few rock outcrops that were not observed in mapping can be expected.

This Pacolet soil is poorly suited to farming because of slope and the eroded surface layer. However, satisfactory yields of hay and pasture can be obtained if good management is used.

Loblolly pine and yellow-poplar are moderately suited to this soil. The hazard of erosion, equipment limitations, and seedling mortality are woodland management concerns.

This soil is moderately suited to most sanitary facilities and building site and recreational development, mainly because of slope. There is a severe hazard of erosion prior to establishing permanent plant cover.

This Pacolet soil is in capability subclass IVe and woodland suitability subclass 4c.

PhC—Pacolet-Urban land complex, 2 to 10 percent slopes. This complex consists of areas of well drained Pacolet soil and Urban land so intermingled they could not be mapped separately at the scale selected. This very gently sloping and gently sloping complex is on

hillsides and narrow ridgetops on uplands of the Southern Piedmont. Mapped areas are 25 to 100 acres.

Pacolet soil makes up about 55 percent of the complex. Typically, the surface layer is reddish brown sandy loam about 3 inches thick. The subsoil is red and extends to a depth of about 36 inches. The upper part of the subsoil is sandy clay loam, the middle part is clay loam, and the lower part is sandy clay loam that has strong brown mottles. The underlying material to a depth of 60 inches or more is weathered rock that crushes to sandy clay loam or sandy loam.

Pacolet soils are low in natural fertility and organic matter content. These soils are medium acid to very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. The root zone is easily penetrated by plant roots.

Urban land makes up about 40 percent of each mapped area. It is private dwellings, industrial sites, streets and sidewalks, shopping centers, parking lots, airports, schools, and churches. The soils have been altered by grading, cutting, filling, shaping, and smoothing.

The Pacolet soil is moderately suited to most sanitary facilities and building site and recreational development mainly because of slope. The common plants used for turf, landscaping, and vegetable gardens grow well. However, there is a severe hazard of erosion prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This complex is not assigned to a capability subclass or woodland suitability subclass.

Pm—Pelham loamy sand. This poorly drained, nearly level soil is on narrow alluvial plains and in depressional areas on uplands of the Southern Coastal Plain. It is commonly flooded for brief periods from early in winter to early in spring. Slopes are 0 to 2 percent. Mapped areas are 20 to 100 acres.

Typically, the surface layer is very dark gray loamy sand about 5 inches thick. The subsurface layer extends to a depth of 23 inches. It is gray loamy sand that has yellowish brown mottles. The subsoil is predominately sandy clay loam to a depth of 72 inches or more. It is gray and has light yellowish brown mottles.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is low. Tilth is good. The water table commonly is at a depth of 0.5 foot to 1.5 feet from the middle of winter to the middle of spring.

Included with this soil in mapping are a few areas of Bibb, Chewacla, and Toccoa soils. Also included are a few small areas of soils that are sandy to a depth of 40 to 60 inches.

Loblolly pine is well suited to this Pelham soil. Wetness and flooding are limitations to use of equipment in managing and harvesting trees. However, operations commonly can be performed during the drier seasons. Drainage is needed to prevent high seedling mortality.

This soil is poorly suited to farming, sanitary facilities, and recreational development because of wetness and flooding. It is severely limited for use as building sites because of wetness and flooding. These limitations can be overcome only by extensive flood control and drainage.

This Pelham soil is in capability subclass Vw and woodland suitability subclass 2w.

Pt—Pits, quarry. This map unit consists of rock quarries. Mapped areas are about 10 to 15 acres.

These quarries range from about 4 to 150 feet or more in depth. The exposed rock in these areas is granite. Some overburden and stockpiles of material are within most areas. The granite material is mined, crushed, and used for various types of construction.

These areas do not support vegetation.

This map unit is not assigned to a capability subclass or woodland suitability subclass.

Rx—Rock outcrop. This map unit is about 90 percent exposed granite bedrock that is bare and hard. It is on ridgetops and hillsides on uplands of the Southern Piedmont. Mapped areas are 5 to 10 acres.

This map unit is poorly suited to the common uses. However, because there is little or no soil material overburden, it provides a source for rock material.

This map unit is not assigned to a capability subclass or woodland suitability subclass.

SeA—Stilson loamy sand, 0 to 3 percent slopes. This moderately well drained, nearly level and very gently sloping soil is on broad areas and in depressions on uplands of the Southern Coastal Plain. Slopes are mostly smooth and convex. Mapped areas are 5 to 60 acres.

Typically, the surface layer is dark grayish brown loamy sand about 6 inches thick. The subsurface layer is loamy sand to a depth of 30 inches. It is pale yellow throughout, except that the lower part has pale brown mottles. The subsoil extends to a depth of 72 inches or more. The upper part is predominately yellow sandy loam; the middle part is brownish yellow sandy clay loam that has light gray mottles; and the lower part is mottled strong brown, light gray, and brownish yellow sandy clay loam. Plinthite makes up 5 to 10 percent of the lower part of the subsoil. A few nodules of ironstone are in the soil to a depth of about 48 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is low. Tilth is good. This soil can be worked throughout a wide range of moisture content. The root zone is deep and easily penetrated by plant roots. A

perched water table commonly is at a depth of 2.5 to 3.0 feet from early in winter to the middle of spring.

Included with this soil in mapping are a few areas of Ailey and Wagram soils. Also included are a few somewhat poorly drained soils that have a thicker sandy surface layer.

This Stilson soil is well suited to farming. However, wetness early in spring is a concern. Drainage commonly helps to overcome this limitation. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, help to increase organic matter content in the soil.

Loblolly pine is moderately suited to this soil. Wetness is the main limitation to equipment use in managing and harvesting the tree crop. However, operations can be performed successfully if equipment is used during the drier seasons.

This soil is poorly suited to most sanitary facilities. It is moderately suited to most building site development because of seasonal wetness. This limitation commonly can be somewhat overcome by drainage. This soil is well suited to recreational development.

This Stilson soil is in capability subclass IIw and woodland suitability subclass 2w.

SuB—Susquehanna sandy loam, 2 to 5 percent slopes. This somewhat poorly drained, very gently sloping soil is on ridgetops and toe slopes on uplands of the Southern Coastal Plain. Slopes commonly are smooth and undulating. Mapped areas are 5 to 20 acres.

Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsurface layer is light yellowish brown sandy loam about 4 inches thick. The subsoil is predominately clay to a depth of 60 inches or more. The upper few inches is strong brown and has red, light brownish gray, and yellowish brown mottles. The rest of the subsoil is predominately gray and has yellowish brown and strong brown mottles.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer and subsurface layer in limed areas. Permeability is very slow, and the available water capacity is medium. Tilth is fair. The root zone is somewhat restricted by the very firm and clayey subsoil.

Included with this soil in mapping are areas of Esto and Wagram soils. Also included are similar soils in which the clay content decreases above a depth of 60 inches. In places, the surface layer is sandy clay loam.

This Susquehanna soil is poorly suited to farming because the subsoil is clayey and the erosion hazard is severe. This soil is moderately suited to hay and pasture.

Loblolly pine is moderately suited to this soil. Equipment limitation is a woodland management concern.

This soil is poorly suited to most sanitary facilities and building site and recreational development. Very slow permeability in the subsoil limits the use of this soil for septic tank absorption fields, and the soil is too clayey for trench type sanitary landfills. The shrink-swell potential needs to be considered if this soil is planned for building site development. Recreational development is limited because of the very slow permeability in the subsoil.

This Susquehanna soil is in capability subclass IVe and woodland suitability subclass 3c.

SuC—Susquehanna sandy loam, 5 to 8 percent slopes. This somewhat poorly drained, gently sloping soil commonly is on hillsides on uplands of the Southern Coastal Plain. Slopes are irregular and short. Mapped areas are 5 to 15 acres.

Typically, the surface layer is dark brown sandy loam about 8 inches thick. The subsoil is predominately clay to a depth of 60 inches or more. The upper few inches is yellowish red and has red and brownish yellow mottles, and the rest of the subsoil is mottled gray and red.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is very slow, and the available water capacity is medium. Tilth is fair. The root zone is somewhat restricted by the very firm and clayey subsoil.

Included with this soil in mapping are areas of Esto and Wagram soils. Also included are areas that have a few shallow gullies. In places, the clay content of the subsoil decreases above a depth of 60 inches.

This Susquehanna soil is poorly suited to farming because the subsoil is clayey and very firm, and the erosion hazard is severe.

Loblolly pine is moderately suited to this soil. Equipment limitation is a woodland management concern.

This soil is poorly suited to most sanitary facilities and building site and recreational development. Very slow permeability in the subsoil limits the use of this soil for septic tank absorption fields, and the soil is too clayey for trench type sanitary landfills. Recreational development is limited because of the very slow permeability in the subsoil. The shrink-swell potential needs to be considered if this soil is planned for building site development.

This Susquehanna soil is in capability subclass VIe and woodland suitability subclass 3c.

To—Toccoa sandy loam. This well drained, nearly level soil is on alluvial plains of streams that flow from the Southern Piedmont. The soil is occasionally flooded for brief periods from early in winter to the middle of spring. Slope is 0 to 2 percent. Mapped areas are 20 to 100 acres.

Typically, the soil is brownish sandy loam to a depth of 60 inches or more. Flakes of mica commonly are throughout the soil.

This soil is medium in natural fertility and organic matter content. It is slightly acid to strongly acid

throughout except for the surface layer in limed areas. Permeability is moderately rapid, and the available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Chewacla soils.

This Toccoa soil is moderately suited to farming because of brief flooding. Good tilth is easily maintained by returning crop residue to the soil.

Loblolly pine and yellow-poplar are well suited to this soil. There are no significant limitations to woodland use or management.

This soil is poorly suited to most sanitary facilities. It is severely limited for use as building sites because of flooding. This limitation can be overcome only by extensive flood control. This soil is moderately suited to recreational development; occasional flooding limits use.

This Toccoa soil is in capability subclass IIw and woodland suitability subclass 1o.

TrB—Troup loamy fine sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on ridgetops on uplands of the Southern Coastal Plain. Slopes are smooth and convex. Mapped areas are 20 to 500 acres.

Typically, the surface layer is dark brown loamy fine sand about 9 inches thick. The subsurface layer is loamy fine sand to a depth of 55 inches. The upper part of the subsurface layer is strong brown, and the lower part is brownish yellow. The subsoil extends to a depth of 80 inches or more. The upper few inches are yellowish brown sandy loam, and the rest of the subsoil is yellowish brown sandy clay loam that has red mottles.

This soil is low in natural fertility and organic matter content. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is rapid in the surface layer and subsurface layer and moderate in the subsoil. The available water capacity is low. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small, intermingled areas of Ailey, Lakeland, and Wagram soils.

This Troup soil is only moderately suited to farming because of the low available water capacity. Crop residue returned to the soil helps to somewhat overcome this limitation.

Loblolly pine is moderately suited to this soil. Equipment limitations and seedling mortality are moderate management concerns.

This soil is poorly suited to sanitary facilities because of seepage. The soil is poorly suited to recreational development because it is too sandy. This soil is well suited to building site development. However, droughtiness is a concern in establishing and maintaining turf, landscape plants, and vegetable gardens.

This Troup soil is in capability subclass IIIs and woodland suitability subclass 3s.

TrC—Troup loamy fine sand, 5 to 8 percent slopes. This well drained, gently sloping soil is on short hillsides on uplands of the Southern Coastal Plain. Slopes are smooth and convex. Mapped areas are 10 to 150 acres.

Typically, the surface layer is dark grayish brown loamy fine sand about 5 inches thick. The subsurface layer is yellowish brown loamy fine sand to a depth of 48 inches. The subsoil is sandy clay loam to a depth of 80 inches or more. The upper part is yellowish brown, and the rest of the subsoil is strong brown and has yellowish brown mottles.

This soil is low in natural fertility and organic matter content. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is rapid in the surface layer and subsurface layer and moderate in the subsoil. The available water capacity is low. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Ailey, Lakeland, and Wagram soils.

This Troup soil is poorly suited to farming because of low available water capacity and slope.

Loblolly pine is moderately suited to this soil. Equipment limitations and seedling mortality are woodland management concerns.

This soil is poorly suited to sanitary facilities because of seepage. Also, the soil is too sandy and is poorly suited to recreational development. This soil is well suited to building site development. However, droughtiness is a concern in establishing and maintaining turf, landscape plants, and vegetable gardens.

This Troup soil is in capability subclass IVs and woodland suitability subclass 3s.

TrD—Troup loamy fine sand, 8 to 12 percent slopes. This well drained, sloping soil is on short hillsides on uplands of the Southern Coastal Plain. Slopes are smooth and convex. Mapped areas are 10 to 150 acres.

Typically, the surface layer is brown loamy fine sand about 4 inches thick. The subsurface layer is loamy fine sand to a depth of 48 inches. The upper part of the subsurface layer is strong brown, and the lower part is yellowish brown. The subsoil is sandy loam to a depth of 80 inches or more. The upper few inches is yellowish brown, and the rest of the subsoil is strong brown.

This soil is low in natural fertility and organic matter content. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is rapid in the surface layer and subsurface layer and moderate in the subsoil. The available water capacity is low. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Lakeland and Vaucluse soils.

This Troup soil is poorly suited to farming because of the low available water capacity and slope.

Loblolly pine is moderately suited to this soil. Equipment limitations and seedling mortality are woodland management concerns.

This soil is poorly suited to sanitary facilities because of seepage. Also, the soil is too sandy and sloping and is poorly suited to recreational development. This soil is moderately suited to building site development because of slope. Droughtiness is a concern in establishing and maintaining turf, landscape plants, and vegetable gardens.

This Troup soil is in capability subclass VIs and woodland suitability subclass 3s.

TSD—Troup and Esto loamy sands, 5 to 15 percent slopes. This map unit consists of well drained, gently sloping and sloping soils on wooded ridgetops and hillsides on uplands of the Sand Hills. Areas of these soils parallel nearby streams or surround short lateral drainageways. Troup and Esto soils are in most mapped areas, but in some areas only one is present. There is no regular pattern. Although composition of this map unit is variable, mapping has been controlled well enough to be interpreted for the present and predicted use of the soils. A typical area is about 50 percent Troup soils and 40 percent Esto soils. However, the proportion of each varies significantly from one mapped area to another. Troup soils are near the upper or middle part of the hillside, and Esto soils are on the lower part. Slopes commonly are convex and complex. Mapped areas are 10 to 160 acres.

Typically, Troup soils have a grayish brown, loamy sand surface layer about 2 inches thick. The subsurface layer extends to a depth of 45 inches. The upper part of the subsurface layer is yellowish brown and the lower part is light yellowish brown. The subsoil is yellowish brown sandy clay loam to a depth of 80 inches or more.

Troup soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout. Permeability is rapid in the surface layer and subsurface layer and moderate in the subsoil. The available water capacity is low. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Typically, Esto soils have a dark grayish brown, loamy sand surface layer about 5 inches thick. The subsurface layer is light yellowish brown sandy loam to a depth of 11 inches. The subsoil is predominately clay to a depth of 60 inches or more. The upper part is reddish yellow; the middle part is reddish yellow and has red, brown, and gray mottles; and the lower part is mottled yellowish brown, dark yellowish brown, and gray.

Esto soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout. Permeability is slow. The available water capacity is medium. Tilth is good. The root zone is deep.

Included with these soils in mapping are small areas of Wagram soils and clayey soils that decrease in clay content above a depth of 60 inches.

Loblolly pine and slash pine are moderately suited to these soils. Equipment limitations and seedling mortality are woodland management concerns on the sandier parts.

These soils are poorly suited to farming because of slope. Also, parts of most mapped areas have a severe erosion hazard, and the sandier parts have low available water capacity. These soils are moderately suited to most sanitary facilities and building site and recreational development. Seepage, shrink-swell potential, clayey subsoil, sandiness, and slope limit land use in parts of each mapped area.

The capability subclass is VIs for the Troup soils and VIe for the Esto soils. The woodland suitability subclass is 3s for the Troup soils and 3o for the Esto soils.

TVD—Troup, Vaucluse, and Pelion loamy sands, 8 to 15 percent slopes. This map unit consists of sloping soils on wooded hillsides on uplands of the Sand Hills. Soil areas parallel nearby streams or surround short lateral drainageways. Well drained Troup and Vaucluse soils and moderately well drained Pelion soil are in most mapped areas, but in some areas only two are present. There is no regular pattern. Although the composition of this map unit is variable, mapping has been controlled well enough to be interpreted for the present and predicted use of the soils. A typical mapped area is about 35 percent Troup soil, 20 percent Vaucluse soil, and 20 percent Pelion soil. However, the proportion varies significantly from one mapped area to another. Troup and Vaucluse soils are near the upper or middle part of the hillside. Pelion soil is on the lower part of smooth to broken hillsides and receives seepage from the higher lying soils. Slopes commonly are convex and complex. Mapped areas are 10 to 60 acres.

Typically, Troup soil has a surface layer of grayish brown loamy sand about 5 inches thick. The subsurface layer is brownish yellow loamy sand to a depth of 50 inches. The subsoil is predominately sandy clay loam to a depth of 80 inches or more. The upper part of the subsoil is yellowish brown, and the lower part is strong brown.

Troup soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout. Permeability is rapid in the surface layer and subsurface layer and moderate in the subsoil. The available water capacity is low. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Typically, Vaucluse soil has a surface layer of brown loamy sand about 4 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of 8 inches. The subsoil is predominately sandy clay loam to a depth of 60 inches or more. The subsoil is firm, brittle, and weakly cemented below a depth of about 24 inches; it is very hard when dry. The upper part mainly is yellowish brown and has red and brown mottles; the middle part is yellowish red and has brown, gray, and red mottles; and the lower part is reddish yellow and has gray and yellow mottles.

Vaucluse soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout. Permeability is low, and the available water

capacity is medium. Tilth is good. The root zone is restricted mainly to the surface layer and upper part of the subsoil.

Typically, Pelion soil has a surface layer of dark gray loamy sand about 3 inches thick. The subsurface layer is pale brown loamy sand about 3 inches thick. The subsoil is predominately sandy clay loam to a depth of 60 inches or more. The upper part of the subsoil is yellowish brown and has strong brown and pale brown mottles; the middle part is yellowish brown and has light brownish gray, strong brown, and red mottles; and the lower part is mottled brown, gray, and yellow.

Pelion soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout. Permeability is moderately slow or slow, and the available water capacity is medium. Tilth is good. The water table commonly is at a depth of 1.0 foot to 2.5 feet from late in fall to the middle of spring.

Included with these soils in mapping are small areas of Orangeburg soils and soils that are clayey and contain kaolin balls. Also included are seasonally wet, sandy, colluvial soils in depressions and on toe slopes.

Loblolly pine and slash pine are moderately suited to these soils. Equipment limitations and seedling mortality are management concerns on the sandier parts of this map unit; wetness commonly is an equipment limitation on the lower part of the hillside.

These soils are poorly suited to farming because of slope. They are moderately suited to most sanitary facilities and building site and recreational development. However, seepage, wetness, sandiness, and slope limit use in parts of each mapped area.

The capability subclass is VIs for the Troup soil and VIe for the Vaucluse and Pelion soils. The woodland suitability subclass is 3s for the Troup soil, 3o for the Vaucluse soil, and 3w for the Pelion soil.

Ua—Udorthents, loamy. This map unit consists chiefly of loamy soil material on uplands of the Sand Hills. These areas were formed by extreme altering of the original soil by cutting, filling, and reshaping mainly to form firing ranges for small arms and light explosives. In many places, the soil mantle has been completely excavated to a depth of 4 to 20 feet leaving only the substratum or soil parent material. In a few places, the map unit is a borrow area.

Commonly, the firing range or borrow area is no longer used and the land is idle or reverting to pine trees and native plants. However, some areas are regularly used. This map unit is mainly in the Fort Benning Military Reservation. Slopes are 1 to 8 percent, though escarpments are in places.

This map unit is not associated with or confined to a particular kind of soil.

Udorthents, loamy, are very low in natural fertility and organic matter content. The available water capacity and tilth vary widely from one area to another.

Abandoned areas can be reclaimed by smoothing, harrowing, liming, fertilizing, and planting suitable grasses and legumes or planting to pine trees. Rye, lovegrass, sericea, and loblolly pine are some of the plants used in erosion control and reclamation.

The suitability of this map unit for other uses varies according to the individual site. This map unit is not assigned to a capability subclass or woodland suitability subclass.

Ub—Udorthents, clayey. This map unit consists mainly of borrow areas mainly on uplands of the Southern Piedmont. Mapped areas are about 10 to 70 acres. Slopes range from 2 to 10 percent.

Typically, Udorthents, clayey, consists of borrow areas that have about 4 to 15 feet of the original soil material removed from the underlying clayey material.

Most mapped areas are abandoned and are revegetated. Some have been shaped, sodded, and planted to trees. Other areas have been excavated and leveled for building sites.

These areas are poorly suited to many uses, though some are suitable for light industry. Many of the mapped areas could be planted to hardwood trees or pine trees or established for wildlife habitat.

This map unit is not assigned to a capability subclass or woodland suitability subclass.

Ud—Urban land. This map unit is mainly in the metropolitan area of Columbus in the uplands of the Southern Piedmont, Southern Coastal Plain, and Sand Hills. Areas on the ridgetops are gently sloping; those on the hillsides are sloping to moderately steep; and those along the drainageways and on the terraces are nearly level.

Commonly, the soil has been modified by cutting, filling, shaping, and smoothing. In places, cuts are deep and weathered bedrock or clayey and sandy sediment are exposed.

Urban land makes up more than 85 percent of each mapped area. It is mainly business districts, shopping centers, schools, churches, parking lots, motels, industries, streets and sidewalks, and housing developments.

Generally, the hazard of erosion is moderate in upland areas that are under construction. In flood plain areas, overflow and sedimentation from the upland are concerns.

Urban land is not assigned to a capability subclass or woodland suitability subclass.

VaB—Vance sandy loam, 2 to 6 percent slopes. This well drained, very gently sloping soil is on ridgetops on uplands of the Southern Piedmont. Slopes are smooth and convex. Mapped areas are 15 to 50 acres.

Typically, the surface layer is yellowish brown sandy loam about 6 inches thick. The subsoil is very firm to a depth of 40 inches and is predominately strong brown clay loam that is mottled red and brown. The underlying material to a depth of 60 inches or more is mottled brown and red sandy loam.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is slow, and the available water capacity is medium. Tilth is good. Root penetration is somewhat restricted because of the firm subsoil.

Included with this soil in mapping are a few small areas of Cecil, Pacolet, and Wedowee soils. Also included are a few small areas of seasonally wet, clayey soils.

This Vance soil is moderately suited to farming because the firm subsoil somewhat restricts root penetration. Erosion is a concern if cultivated crops are grown. Good tilth can be maintained in most places by returning crop residue to the soil. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, reduce runoff and help to control erosion.

Loblolly pine is moderately suited to this soil. There are no significant limitations to woodland use and management.

This soil is poorly suited to most sanitary facilities, and to building site development. Slow permeability in the subsoil limits the use of this soil for septic tank absorption fields. The clayey subsoil is a limitation for trench type sanitary landfills. Shrink-swell potential of the soil needs to be considered in selecting building sites. This soil is well suited to recreational development; however, slow permeability in the subsoil limits some uses.

This Vance soil is in capability subclass IIIe and woodland suitability subclass 3o.

VbC2—Vance sandy clay loam, 6 to 10 percent slopes, eroded. This well drained, gently sloping soil is on hillsides on uplands of the Southern Piedmont. The surface layer is a mixture of remnants of the original surface layer and the upper part of the subsoil. It contains rills, galled spots, and shallow gullies. An occasional deep gully has cut into the subsoil in places. Slopes are convex. Mapped areas are 5 to 20 acres.

Typically, the surface layer is yellowish brown sandy clay loam about 4 inches thick. The subsoil extends to a depth of 36 inches and is very firm. The upper part of the subsoil is yellowish red clay that has red mottles, and the lower part is mottled red, yellowish red, and strong brown clay loam. The underlying material to a depth of 60 inches or more is saprolite that crushes to sandy loam.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is slow and runoff is rapid. The available water capacity is medium. Tilth is fair. Root penetration is somewhat restricted because of the firm subsoil.

Included with this soil in mapping are a few small areas of Pacolet and Wedowee soils.

This Vance soil is poorly suited to farming because of rapid runoff and the severe hazard of erosion. It is moderately suited to hay and pasture.

Loblolly pine is moderately suited to this soil. There are no significant limitations to woodland use and management.

This soil is poorly suited to most sanitary facilities and building site development. Slow permeability in the subsoil limits the use of this soil for septic tank absorption fields. The clayey subsoil is a limitation for trench type sanitary landfills. Shrink-swell potential of the soil needs to be considered in selecting building sites. This soil is well suited to recreational development; however, slow permeability in the subsoil limits some uses.

This Vance soil is in capability subclass IVe and woodland suitability subclass 3o.

VbD2—Vance sandy clay loam, 10 to 15 percent slopes, eroded. This well drained, sloping soil in on hillsides on uplands of the Southern Piedmont. The surface layer is a mixture of parts of the original surface soil and the upper part of the subsoil. Slopes are short and convex and contain rills, galled spots, shallow gullies, and an occasional deep gully. Mapped areas are 15 to 60 acres.

Typically, the surface layer is brownish yellow sandy clay loam about 4 inches thick. The subsoil extends to a depth of about 36 inches and is firm. The upper few inches of the subsoil is strong brown clay that has red mottles; the middle part is mottled, strong brown and red clay; and the lower part is mottled, red and strong brown sandy clay. The underlying material to a depth of 60 inches or more is weathered granite mixed with pockets of clay.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout. Permeability is slow and runoff is rapid. The available water capacity is medium. This soil has poor tilth. Root penetration is somewhat restricted because of the firm subsoil.

Included with this soil in mapping are small areas of Cecil and Pacolet soils. Also included are a few small areas of soils that have a high content of mica.

Areas of this Vance soil are wooded. Loblolly pine and yellow-poplar are moderately suited to this soil. There are no significant limitations to woodland use or management.

This soil is poorly suited to most sanitary facilities and building site development. Slow permeability in the subsoil limits the use of this soil for septic tank absorption fields. The clayey subsoil is a limitation for trench type sanitary landfills. Shrink-swell potential of the soil needs to be considered in selecting building sites. This soil is well suited to recreational development; however, slow permeability in the subsoil limits some uses.

This Vance soil is in capability subclass VIe and woodland suitability subclass 3o.

VeC—Vaucluse sandy loam, 5 to 8 percent slopes. This well drained, gently sloping soil is on ridgetops and hillsides on uplands of the Sand Hills. Slopes are smooth and convex. Mapped areas are 10 to 60 acres.

Typically, the surface layer is grayish brown sandy loam about 6 inches thick. The subsoil is sandy clay loam to a depth of 60 inches or more. The subsoil is firm and brittle below a depth of about 30 inches; it is very hard when dry. The upper part of the subsoil is strong brown; the middle part is yellowish red and has strong brown concretions; and the lower part is mottled strong brown, yellowish brown, and light gray.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is slow, and the available water capacity is medium. This soil has good tilth. The root zone is restricted mainly to the surface layer and upper part of the subsoil.

Included with this soil in mapping are a few areas of Ailey, Troup, and Wagram soils.

This Vaucluse soil is poorly suited to farming. It is moderately suited to hay and pasture. Use of the soil is limited because of the firm, brittle layer in the subsoil and slope. Erosion is a severe hazard if cultivated crops are grown.

Loblolly pine is moderately suited to this soil. There are no significant limitations to woodland use and management.

This soil is well suited to most sanitary facilities and building site development. However, slow permeability in the middle and lower parts of the subsoil limits the use of this soil for septic tank absorption fields. Also, the soil is somewhat droughty. This is a concern in establishing and maintaining turf, landscape plants, and vegetable gardens. Erosion is a severe hazard prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This Vaucluse soil is in capability subclass IIIe and woodland suitability subclass 3o.

VeD—Vaucluse sandy loam, 8 to 15 percent slopes. This well drained, sloping and moderately steep soil is on hillsides on uplands of the Sand Hills. Slopes are short and convex. Mapped areas are 10 to 60 acres.

Typically, the surface layer is grayish brown sandy loam about 6 inches thick. The subsoil is firm and brittle below a depth of 26 inches; it is very hard when dry. The upper part of the subsoil is yellowish red and has red mottles, and the middle and lower parts are mottled red, yellowish red, strong brown, and light gray.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is slow, and the available water capacity is medium. This soil has good tilth. The root zone is restricted mainly to the surface layer and upper part of the subsoil.

Included with this soil in mapping are a few areas of Ailey, Lakeland, and Troup soils.

This Vaucluse soil is poorly suited to farming. Use of the soil is limited mainly because of slope. Erosion is a severe hazard if cultivated crops are grown. This soil is moderately suited to hay and pasture.

Loblolly pine is moderately suited to this soil. There are no significant limitations for woodland use and management.

This soil is moderately suited to most sanitary facilities and building site and recreational development because of slope. Also, slow permeability in the middle and lower parts of the subsoil limits this soil for septic tank absorption fields. The soil is somewhat droughty, and this is a concern in establishing and maintaining turf and landscape plants. Erosion is a severe hazard prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This Vaucluse soil is in capability subclass IVe and woodland suitability subclass 3o.

WaB—Wagram loamy sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on narrow to broad ridgetops on the Southern Coastal Plain. Slopes are smooth and convex. Mapped areas are 5 to 200 acres.

Typically, the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsurface layer is loamy sand to a depth of 36 inches. It is pale brown in the upper part and pale yellow in the lower part. The subsoil extends to a depth of 72 inches or more. The upper few inches is yellowish brown sandy loam; the middle part is yellowish brown sandy clay loam that has pale brown and strong brown mottles; and the lower part is mottled yellowish brown, strong brown, and light gray sandy loam.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderately rapid, and the available water capacity is low. Tilth is good. This soil can be worked throughout a wide range of moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Ailey, Dothan, and Troup soils. Also included are a few small soil areas that are redder than is common to the Wagram series. A few areas of soils that contain more than 5 percent plinthite in the subsoil are included.

This Wagram soil is moderately suited to farming because of the low available water capacity. Returning crop residue to the soil helps to increase the available water capacity and decrease the leaching of plant nutrients.

Loblolly pine is moderately suited to this soil. Equipment limitations and seedling mortality are woodland management concerns.

This soil is well suited to most sanitary facilities and building site development. However, droughtiness is a concern if this soil is used for turf, landscaping, and vegetable gardens. This soil is moderately suited to recreational development because the thick surface and subsurface layer is too sandy.

This Wagram soil is in capability subclass IIs and woodland suitability subclass 3s.

WaC—Wagram loamy sand, 5 to 8 percent slopes. This well drained, gently sloping soil is predominately on hillsides on uplands of the Southern Coastal Plain. Slopes are smooth and convex. Mapped areas are 10 to 50 acres.

Typically, the surface layer is grayish brown loamy sand about 8 inches thick. The subsurface layer is light yellowish brown loamy sand to a depth of 23 inches. The subsoil is predominately sandy clay loam to a depth of 72 inches or more. It is yellowish brown throughout except that the lower part also is mottled pale brown and reddish brown.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderately rapid, and the available water capacity is low. Tilth is good. The soil can be worked throughout a wide range of moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Ailey, Troup, and Vaucluse soils. Also included are a few small areas of soils that are redder than is common to the Wagram series. A few areas of soils that contain more than 5 percent plinthite in the subsoil are included.

This Wagram soil is moderately suited to farming because of the low available water capacity and slope. Returning crop residue to the soil increases the available water capacity and decreases the leaching of plant nutrients.

Loblolly pine is moderately suited to this soil. Equipment limitations and seedling mortality are woodland management concerns.

This soil is well suited to most sanitary facilities and building site development. However, droughtiness is a concern if this soil is used for turf, landscaping, and vegetable gardens. This soil is moderately suited to recreational development because the thick surface and subsurface layer is too sandy.

This Wagram soil is in capability subclass IIIs and woodland suitability subclass 3s.

WbA—Wahee fine sandy loam, 0 to 2 percent slopes. This somewhat poorly drained, nearly level soil is on terraces of the larger streams of the Southern Coastal Plain. It is occasionally flooded for brief periods from early in winter to the middle of spring. Mapped areas are 5 to 60 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 7 inches thick. The subsurface layer is light yellowish brown fine sandy loam to a depth of 12 inches. The subsoil extends to a depth of 60 inches or more. The upper part is yellowish brown clay, the middle part is light brownish gray clay that has strong brown and red mottles, and the lower part is light gray sandy clay loam that has yellowish brown and brownish yellow mottles.

This soil is low in natural fertility and organic matter content. It is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Permeability is slow, and the available water capacity is medium. The water table is at a depth of 0.5 foot to 1.5 feet from early in winter to early in spring.

Included with this soil in mapping are areas of Troup and Wagram soils.

This Wahee soil is poorly suited to farming because of wetness and flooding. It is moderately suited to hay and pasture. If this soil is drained, protected against flooding, and properly managed, good yields can be obtained.

Slash pine, loblolly pine, sweetgum, and yellow-poplar are well suited to this soil. Because of wetness and flooding, the use of equipment is limited and seedling mortality is high. Some places need to be drained to reduce this problem. Logging during the drier seasons helps in managing and harvesting the tree crop.

This soil is poorly suited to sanitary facilities and recreational development because of wetness and flooding. It is severely limited for use as building sites because of wetness and flooding. These limitations can be overcome to some extent by flood control and drainage.

This Wahee soil is in capability subclass IIIw and woodland suitability subclass 2w.

WeC—Wedowee sandy loam, 6 to 10 percent slopes. This well drained, gently sloping soil is on narrow upland ridgetops of the Southern Piedmont. Slopes are smooth and convex. Mapped areas are 10 to 75 acres.

Typically, the surface layer is grayish brown sandy loam about 5 inches thick. The subsoil extends to a depth of about 37 inches. The upper part of the subsoil is yellowish red sandy clay loam, the middle part is yellowish red sandy clay that is mottled red and strong brown, and the lower part is mottled yellowish brown and red sandy clay loam. The underlying material to a depth of 60 inches or more is weathered gneiss and granite.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of a similar soil that has a gravelly sandy loam surface layer. A similar soil that has a sandy loam subsoil is also included. A few intermingled areas of Pacolet soils are included.

This Wedowee soil is moderately suited to farming because of slope. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a concern if cultivated crops are grown. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, reduce runoff and help to control erosion.

Loblolly pine and yellow-poplar are moderately suited to this soil. There are no significant limitations to woodland use and management.

This soil is moderately suited to most sanitary facilities and building site and recreational development because of slope. Moderate permeability in the subsoil limits the use of this soil for septic tank absorption fields. Shrink-swell potential of the subsoil needs to be considered in selecting building sites. The common plants used for turf, landscaping, and vegetable gardens grow well. However, there is a severe hazard of erosion prior to establishing permanent plant cover. Tillage operations across the slope and winter cover crops help to control erosion.

This Wedowee soil is in capability subclass IIIe and woodland suitability subclass 3o.

WeE—Wedowee sandy loam, 10 to 35 percent slopes. This well drained, sloping to steep soil is on hillsides on uplands of the Southern Piedmont. Slopes commonly are long, smooth, and convex. Mapped areas are 30 to 150 acres.

Typically, the surface layer is grayish brown sandy loam about 5 inches thick. The subsurface layer is yellow sandy loam 5 inches thick. The subsoil extends to a depth of about 36 inches. The upper few inches is reddish yellow sandy clay loam, the middle part is yellowish red sandy clay, and the lower part is reddish yellow and yellowish brown sandy clay loam. The underlying material to a depth of 60 inches or more is weathered gneiss and granite.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are similar soils that have less clay in the subsoil than is common to the Wedowee soils. Also included are areas of soil that have hard bedrock at a depth of about 40 to 50 inches; in places, it is nearer to the surface. Stones are on the surface in several places.

Loblolly pine and yellow-poplar are moderately suited to this Wedowee soil. This sloping to steep soil has an erosion hazard, and conventional equipment is somewhat limited for woodland use and management.

This soil is poorly suited to farming, sanitary facilities, and building site and recreational development because of slope. There is a severe hazard of erosion prior to establishing permanent plant cover.

This Wedowee soil is in capability subclass VIe and woodland suitability subclass 3r.

WhA—Wickham fine sandy loam, 0 to 2 percent slopes. This well drained, nearly level soil is on stream terraces of the Southern Piedmont and near the larger streams of the Sand Hills. Mapped areas are 5 to 50 acres.

Typically, the surface layer is brown fine sandy loam, about 8 inches thick. The subsoil extends to a depth of 54 inches. The upper part is strong brown sandy loam, the middle part is yellowish red sandy clay loam, and the lower part is strong brown sandy loam. The underlying material is yellowish red sandy loam to a depth of 60 inches or more.

This soil is low in natural fertility and organic matter content. It is medium acid to very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and the available water capacity is medium. Tilth is good. This soil can be worked thoughout a wide range of moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of soils that have a high content of mica.

This Wickham soil is well suited to farming. Good tilth is easily maintained by returning crop residue to the soil. Conservation tillage and the use of cover crops, including grasses and legumes in the cropping system, help to increase organic matter content in the soil.

Loblolly pine and yellow-poplar are well suited to this soil. There are no significant limitations for woodland use and management.

This soil is well suited to sanitary facilities and building site and recreational development. However, seepage is a limitation for trench type sanitary landfills. The common plants used for turf, landscaping, and vegetable gardens grow well.

This Wickham soil is in capability class I and woodland suitability subclass 2o.

important farmland

This section gives the extent and location of the land in Muscogee County that is important for producing food, feed, fiber, forage, and oilseed crops.

The map units that make up *prime farmland* and *additional farmland of statewide importance*, and the acreage of each, are listed in table 5. This list does not constitute a recommendation for a particular land use. The location of each map unit is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described in the section "Detailed soil map units."

prime farmland

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing

food, feed, forage, fiber, and oilseed crops. It has adequate soil quality, growing season, and moisture supply to economically produce sustained high crop yields if acceptable farming methods are used. Prime farmland produces the highest yields with minimal inputs of energy and money, and farming it results in the least damage to the environment. Prime farmland is of major importance in satisfying the nation's short- and long-range needs for food and fiber. The supply of high quality farmland is limited, and the U.S. Department of Agriculture recognizes that all levels of government, as well as individuals, must encourage and facilitate the use of prime farmland with wisdom and foresight.

Prime farmland is either currently used for producing food or fiber or is available for this use. Urban or built-up land, water areas, or areas in other uses that preclude later use of the soils for farmland are not included. Urban and built-up land is any contiguous unit of land of 10 acres or more that is used for residences, industrial sites, commercial sites, construction sites, institutional sites, public administrative sites, railroad yards, small parks, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water-control structures and spillways, shooting ranges, and so forth.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation or irrigation. It has favorable temperature and growing season and acceptable soil reaction. It has few or no rocks and is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods and is not flooded during the growing season. Slope ranges mainly from 0 to 6 percent. For further information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

In Muscogee County, 23,305 acres, or 17 percent of the county, meets the soil requirements for prime farmland (see table 5). Areas are scattered throughout the county, but most are in map units 4 and 7 on the general soil map. Some areas of prime farmland are on the Fort Benning Military Reservation and are not available for agricultural use.

additional farmland of statewide importance

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on additional farmland of statewide importance.

In Muscogee County, 27,261 acres, or 19 percent of the county, is additional farmland of statewide importance (see table 5). This farmland consists of soils that are important to the agricultural resource base in the county but that do not meet the requirements for prime farmland. These soils are more erodible, droughty, seasonally wet, difficult to cultivate, and, usually, less productive than prime farmland soils. The slope is 10 percent or less.

use and management of the soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and suitability of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops, pasture, and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the suitability and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

crops and pasture

James E. Helm, conservation agronomist, Soil Conservation Service, helped to prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Soil erosion is the major concern on most of the soils used for farming in Muscogee County. If slope is more than 2 percent, erosion is a hazard. Cecil, Dothan, Esto, Orangeburg, and Pacolet soils, for example, have slopes of more than 2 percent.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a clayey subsoil, such as Cecil, Esto, Hiwassee, Pacolet, Vance, and Wedowee soils, and on such soils as Ailey and Vaucluse that have a layer in the subsoil that limits the depth of the root zone. Second, soil erosion on farmland results in sedimentation of streams (fig. 7). Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

Erosion control practices provide a protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps plant cover on the soil for extended periods helps to maintain the productive capacity of the soil. On livestock farms, which require pasture and hay, the grass-legume forage crops in the cropping system reduce erosion on sloping land, provide nitrogen, and improve tilth for the following crop.

Slopes commonly are short, and contour tillage or terracing is not practical on most of the gently sloping Pacolet, Vance, Vaucluse, and Wedowee soils. On these soils, a cropping system that provides substantial vegetative cover is needed to control erosion.

In some fields, tilling or preparing a good seedbed is difficult on soils that are eroded because the original friable surface soil has been eroded away. Those areas are on gently sloping Cecil soils and gently sloping and sloping Pacolet and Vance soils.

Conservation tillage and leaving crop residue on the surface help to increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most of the soils in the county. Conservation

Figure 7.—Damage by sediment to a road, culvert, and downstream watercourse. This sandy material washed from an area of Troup soils that was being converted from farm to nonfarm use.

tillage for corn and soybeans is effective in reducing erosion on sloping land and can be adapted to most of the soils in the county.

Terraces and diversions reduce the length of the slope and reduce runoff and erosion. They are most practical on the deep, well drained soils that have smooth and convex slopes. Very gently sloping and gently sloping Cecil, Dothan, Hiwassee, and Orangeburg soils are suitable for terraces. The other soils are less suitable for terraces and diversions because of irregular slopes, sandiness, excessive wetness in the terrace channels, or a clayey subsoil which would be exposed in the terrace channels.

Contour farming helps to control erosion. It is best adapted to soils that have smooth, uniform slopes, including most areas of the very gently sloping or gently sloping Cecil, Dothan, Hiwassee, Orangeburg, and Pacolet soils.

Information for the design of erosion control practices for each kind of soil is contained in the Technical Guide available in local offices of the Soil Conservation Service.

Drainage is a major management need on most of the seasonally wet soils if they are used for farming. Some soils are so wet that the production of crops common to the area is generally not possible. These are the poorly drained Bibb, Chastain, and Pelham soils and the very poorly drained Hydraquents.

Unless artificially drained, the somewhat poorly drained soils are so wet that crops are damaged during most years. In this category are the Chewacla soils. Dogue and Stilson soils are moderately well drained, but they need artificial drainage most years if farmed.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and tile drainage is needed in most areas of the moderately well drained and somewhat poorly drained soils used for intensive row cropping. Drains have to be more closely spaced in slowly permeable soils than in more permeable soils. Tile

drainage is slow in Wahee soils. Adequate outlets for tile drainage systems are difficult to find in some areas, but they are available in most places.

The fertility of most of the soils in Muscogee County is naturally low. The soils on uplands are naturally very strongly acid or strongly acid; those on alluvial plains and stream terraces commonly are less acid. If the soils used for cultivated crops and pasture have never been limed, applications of ground limestone are needed to raise the pH level sufficiently for good growth of legumes and other crops that grow best on nearly neutral soils. The levels of available phosphorus and potash are naturally low in most of these soils. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the need of the crops, and on the desired level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

Soil tilth is an important factor in the germination of seeds and the infiltration of water into the soil. Soils with good tilth are granular and porous.

Most of the soils used for crops in Muscogee County have a surface layer of sandy loam or loamy sand that is low in organic matter content. Tilth generally is good except on the eroded Cecil, Pacolet, and Vance soils, in which the subsoil is exposed. Regular additions of crop residue, manure, and other organic material help to improve or maintain tilth.

Fall plowing generally is not a good practice in the county. Most of the cropland consists of soils that are subject to damaging erosion if plowed in the fall.

Corn and soybeans are commonly grown and are well suited to the soils and climate of the county. Grain sorghum, sunflowers, peanuts, potatoes, wheat, and similar crops can also be grown. Rye is the common close-growing crop used as a winter cover crop.

Pasture grasses adapted and grown in Muscogee County are bahiagrass, common and hybrid bermudagrass, and tall fescue. Bahiagrass is grown on a wide range of soils. It can be maintained by moderate fertilization and good grazing practices. Response to nitrogen application, if it is combined with good management, is good. Bermudagrass is grown on most soils in the county. It commonly requires more nitrogen fertilizer than bahiagrass. The hybrid variety generally is used for hay, but it requires very high nitrogen applications for high yields. Hybrids that are cold hardy and can withstand the winters in Muscogee County are recommended. Tall fescue is suited and could be grown on most soils in the county. However, sandy soils, such as Ailey, Lakeland, and Troup, are droughty and tall fescue is not suited. Good management requires annual fertilization and operations which restrict grazing during hot periods of the year.

Specialty crops grown commercially in the survey area are vegetables and nursery plants. A small acreage is used for sweet corn, tomatoes, peppers, and other vegetables. In addition, large areas could be adapted to other special crops, such as apples, blueberries, grapes, and many vegetables. Pecans are important nut trees.

Deep soils that have good natural drainage and that warm up early in spring are especially well suited to many vegetables. In the county, these are the Ailey, Congaree, Dothan, Hiwassee, Orangeburg, Troup, Wagram, and Wickham soils that have slopes of less than 6 percent. Crops can generally be planted and harvested earlier on all of these soils than on other soils in the county.

If adequately drained, or adequately drained and protected from flooding, well drained Toccoa soils, somewhat poorly drained Chewacla soils, and moderately well drained Dogue, Eunola, and Stilson soils are suited to a wide range of vegetables.

Most of the well drained, nearly level to gently sloping soils in the county are suitable for orchards and nursery plants. Soils in low positions where frost is frequent and air drainage is poor, however, generally are poorly suited to early vegetables, small fruits, and orchards.

Latest information and suggestions for growing specialty crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss. Fertilizer needs of specific crops on specific soils can be determined by soil tests. General fertilizer recommendations for field crops are also available (*3*).

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed

because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed soil map units."

gardening and landscaping

Gerald Smith, extension horticulturist, and Doug Crater, extension horticulturist-floriculturist, University of Georgia, helped to prepare this section.

Homeowners who landscape need to know the kinds of soil on their property and the trees and ornamental plants best suited to those soils. The best soils for gardening have good internal drainage, a deep root zone, and optimum fertility. They hold enough water for plant use during prolonged dry periods, and they are permeable to water, air, and roots. Incorporating organic matter into the surface layer increases the available water capacity and improves tilth. Applying mulch helps to retain moisture and prevent evaporation. The degree of acidity of the soil should be considered in selecting plants.

Annuals such as ageratum, alyssum, larkspur, marigold, morningglory, petunia, portulaca, salvia, sunflower, verbena, vinca, and zinnia are particularly well suited to the droughty Ailey, Fuquay, Lakeland, Troup, and Wagram soils. Roses, most annual flowers, most vegetables, and most grasses are suited to soils that are neutral or slightly acid. Dahlia, gladiolus, petunia, Shasta daisy, and zinnia grow best on neutral soils. Azaleas, camellias, and similar plants need acid soils. Such annuals as alyssum, burning bush, calendula, candytuft, celosia, dianthus, dusty miller, marigold, nasturtium, petunia, phlox, portulaca, verbena, and vinca tolerate soils that are not fertilized and are low in organic matter.

Most soils in Muscogee County are well suited to the trees and ornamental plants commonly used in landscaping. Cecil, Congaree, Dothan, Hiwassee, Masada, Orangeburg, Pacolet, Toccoa, Wedowee, and Wickham soils are well suited to yard and garden plants. In soils where the water table is high or the available water capacity low, only specified plants should be selected for planting. See table 8.

Table 8 shows two soil groups and the map units in each group. It lists the deciduous and evergreen trees, the shrubs, the vines, and the ground cover suited to the soils in each group. The table does not include all soils that are well suited to plants listed. The chief considerations in determining suitability are a high water table or a low available water capacity.

Table 17 gives data on permeability, available water capacity, and soil reaction. Other information on characteristics of the soils is given in the section "Detailed soil map units." For information concerning suitability of plants not mentioned in this section, consult a local nurseryman or the county extension agent.

woodland management and productivity

Gary L. Tyre, forester, Soil Conservation Service, helped to prepare this section.

This section explains soil-tree growth relationships in Muscogee County. It can provide a useful tool in planning conservation efforts and arriving at investment and management decisions.

Originally, extensive stands of hardwoods, hardwoods mixed with pines, and pure pine stands covered much of Muscogee County. Since that time, major changes have altered the forest cover in the county. Major forces currently affecting forest land use are Fort Benning Military Reservation and the urbanizing area centered around Columbus.

According to a 1972 USDA Forest Service Resource Bulletin (*8*), about 95,000 of the nearly 141,000 acres in Muscogee County are classified as commercial forest land. Atypically, almost none of the commercial forest land is held by the forest industry or farmers. Almost half of this land is in federal ownership with the rest (55,000 acres) held by miscellaneous private owners.

There are currently three major forest types in Muscogee County. About 55,000 acres is in loblolly pine or shortleaf pine. Oak-pine and oak-hickory forests account for most of the rest of the area.

Forest land in Muscogee County is well utilized. Less than 4 percent is described as nonstocked or poorly stocked. This compares favorably with central Georgia as a whole, where nonstocked conditions exist on about 3 percent of the commercial forest land. About 41 percent of the land in the county is stocked in the sawtimber-size class, compared to 35 percent for the rest of central Georgia. Stocking sizes are probably influenced by the extensive federal ownership in the county. Most of the potential for improvement in woodland management lies on the miscellaneous private holdings.

The relative productivity of forest land in the county is low. Only about 4 percent of the land is capable of producing 85 to 120 cubic feet per acre annually, while 92 percent of the land will yield 50 to 85 cubic feet per acre per year.

Because of the varied physiographic provinces in Muscogee County, typical forest soils vary. Highly productive upland soils are in the Southern Coastal Plain. These are the Dothan and Orangeburg soils. Cecil, Pacolet, and Wedowee soils commonly are on uplands of the Southern Piedmont and are only slightly less productive than the Dothan and Orangeburg soils. The least productive soils on ridges and hillsides are in the Sand Hills. Troup and Vaucluse soils are typical and are associated with site indices ranging from the mid 70's to mid 80's. Most of the pure pine stands in the county are on upland sites like those previously noted. Significant stands of pine mixed with hardwoods and hardwood stands are on lower slopes and alluvial lands associated with such soils as Eunola, Wickham, Toccoa, Chewacla, Bibb, and Pelham soils.

Table 9 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w* indicates excessive water in or on the soil; *c*, clay in the upper part of the soil; *s*, sandy texture; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: w, c, s, and r.

In table 9, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly

planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. Site index was determined at age 30 years for eastern cottonwood, age 35 years for American sycamore, and age 50 years for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

recreation

The soils of the survey area are rated in table 10 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 10, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 13 and interpretations for dwellings without basements and for local roads and streets in table 12.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

wildlife habitat

Jesse Mercer, Jr., biologist, Soil Conservation Service, helped to prepare this section.

Muscogee County is highly urban, but it provides habitat for a variety of wildlife species. The best quality woodland and wetland wildlife habitat of the county is on such soils as Bibb, Chewacla, Pelham, and Toccoa soils.

Woodlands provide habitat for deer, turkey, squirrel, raccoon, and many nongame animals and songbirds. Quail, rabbit, and dove are abundant near cropland areas. Habitat for waterfowl and other wildlife dependent on an aquatic environment is most abundant along the Chattahoochee River, Upatoi Creek, and Lake Oliver.

Some stream fishing is done on the Chattahoochee River and Upatoi Creek. However, most fish habitat is provided in about 450 farm ponds and Lake Oliver.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and

distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants (fig. 8).

Figure 8.—Bicolor lespedeza on Esto sandy loam, 2 to 5 percent slopes, in an area of Fort Benning Military Reservation. The soil is well suited to producing food and cover for common types of wildlife.

In table II, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of

these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse, seeds, and cones. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, shore birds, muskrat, mink, and beaver.

engineering

Joe A. Stevens, Jr., assistant State conservation engineer, Soil Conservation Service, helped to prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

building site development

Table 12 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock or a firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

sanitary facilities

Table 13 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 13 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 13 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope and bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 13 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, and soil reaction affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

construction materials

Table 14 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to

the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 14, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

water management

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders or organic matter. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement; permeability; depth to a high water table; slope; and susceptibility to flooding. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the depth of the root zone and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. Low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 19.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

engineering index properties

Table 16 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 19.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent.

Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

physical and chemical properties

Table 17 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 17, the estimated content of organic matter of the plow layer is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

soil and water features

Table 18 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

Table 18 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 18 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 18.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

engineering index test data

Table 19 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil series and their morphology." The soil samples were tested by the Office of Materials and Research, Georgia Department of Transportation.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO); Liquid limit—T 89 (AASHTO); Plasticity index—T 90 (AASHTO); Moisture density, Method A—T 99 (AASHTO); Volume change—Georgia Highway Standard (GHD-6).

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*9*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 20, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning flood plain, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, kaolinitic, acid, thermic Typic Fluvaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

soil series and their morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*7*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*9*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

Ailey series

The Ailey series consists of well drained soils that are moderately permeable in the upper part of the subsoil and slowly permeable in the Bx horizon. These soils formed in thick beds of sandy and loamy marine sediment. They are on uplands of the Sand Hills. Slope is 2 to 12 percent.

Ailey soils are associated with Dothan, Lakeland, Troup, Vaucluse, and Wagram soils on the uplands. The associated soils are on the same landscape as the Ailey soils. Dothan, Lakeland, Troup, and Wagram soils do not have a fragipan. Dothan soils have more than 5 percent plinthite in some horizon above a depth of 60 inches.

Lakeland soils are excessively drained and are sandy to a depth of more than 80 inches, and Troup soils are grossarenic. Vaucluse soils have an A horizon less than 20 inches thick.

Typical pedon of Ailey loamy coarse sand, 2 to 5 percent slopes, from the bank of a borrow pit, 10.0 miles northeast of Columbus, 0.6 mile west of the intersection of Chatsworth Road and Midland Road, on the south side of Chatsworth Road:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) loamy coarse sand; single grained; loose; many fine and very fine roots; very strongly acid; gradual wavy boundary.

A2—5 to 32 inches; light yellowish brown (10YR 6/4) loamy coarse sand; weak fine granular structure; very friable; few fine and very fine roots; very strongly acid; abrupt wavy boundary.

B2t—32 to 43 inches; yellowish brown (10YR 5/6) sandy clay loam; few medium distinct yellowish red (5YR 5/6) mottles and few coarse distinct red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; very firm; few thin discontinuous clay films; few fine and very fine roots; very strongly acid; gradual wavy boundary.

Bx1—43 to 55 inches; mottled yellowish brown (10YR 5/8) and yellowish red (5YR 5/6) sandy clay loam; weak coarse angular blocky structure; firm, brittle, and weakly cemented; few fine kaolin particles; few thin patchy clay films on faces of peds; common coarse sand grains; very strongly acid; gradual wavy boundary.

Bx2—55 to 72 inches; mottled yellowish brown (10YR 5/8), yellowish red (5YR 5/6), and light gray (10YR 7/1) sandy clay loam; weak coarse angular blocky structure; firm, brittle, and weakly cemented; few thin patchy clay films on faces of peds; very strongly acid.

Solum thickness ranges from 60 to 96 inches. The soil is strongly acid or very strongly acid except for the surface layer in limed areas.

The A horizon is 20 to 40 inches thick. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2; or hue of 10YR, value of 5, and chroma of 2. The A horizon is loamy coarse sand and loamy sand. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 4; or hue of 10YR, value of 5, and chroma of 6.

The B1 horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 4 or 6. The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8. Reddish, brownish, and yellowish mottles are in some pedons. The Bx horizon begins at a depth of 35 to 55 inches. This horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8. It has few to many, fine or medium, brown, gray, yellow, or red mottles. In places, the Bx horizon is mottled brown, gray, yellow, or red.

Bibb series

The Bibb series consists of poorly drained, moderately permeable soils that formed in loamy and sandy alluvial sediment. These soils are on flood plains of the Southern Coastal Plain. Bibb soils have a water table at a depth of about 0.5 foot to 1.5 feet from early in winter to the middle of spring. Slope is 0 to 2 percent.

Bibb soils are associated with Dothan, Dogue, Pelham, Toccoa, and Troup soils. Well drained Dothan and Troup soils and moderately well drained Dogue soils are on uplands or stream terraces and have an argillic horizon. Poorly drained Pelham soils and well drained Toccoa soils are mainly on flood plains; however, Pelham soils have an argillic horizon.

Typical pedon of Bibb sandy loam, in a wooded area at Fort Benning, 3.4 miles southeast of the junction of Chatsworth Road and the 10th Armored Division Road:

A11—0 to 6 inches; black (10YR 2/1) sandy loam; weak fine granular structure; friable; many fine and medium roots; very strongly acid; gradual wavy boundary.

A12g—6 to 17 inches; dark gray (N 4/0) loamy sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary.

C1g—17 to 36 inches; dark gray (10YR 4/1) sandy loam; weak fine granular structure; very friable; strongly acid; gradual wavy boundary.

C2g—36 to 50 inches; dark gray (10YR 4/1) loamy sand; massive; very friable; strongly acid; gradual wavy boundary.

C3g—50 to 60 inches; dark gray (10YR 4/1) sandy loam; massive; very friable; very strongly acid.

Thickness of the sediment ranges from 62 to 80 inches or more. The soil is strongly acid or very strongly acid except for the surface layer in limed areas.

The A horizon is 6 to 17 inches thick. The A11 horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2; or it has hue of 7.5YR, value of 2 to 4, and chroma of 2. The A12g horizon has hue of 2.5Y, value of 3 or 4, and chroma of 2; or it is neutral; or it has hue of 10YR, value of 3 to 5, and chroma of 1 or 2.

The C horizon has hue of 10YR or 5Y, value of 4 or 5, and chroma of 1 or 2; or it has hue of 2.5Y, value of 4 or 5, and chroma of 2; or it is neutral. The C horizon is sandy loam, loamy sand, or silt loam. Some pedons have few or common, fine or medium, brown and yellow mottles.

Cecil series

The Cecil series consists of well drained, moderately permeable soils that formed in material weathered from granite. These soils are on uplands of the Southern Piedmont. Slope is 2 to 10 percent.

Cecil soils are associated with Pacolet, Vance, and Wedowee soils on the uplands. The associated soils have a thinner solum than is common to Cecil soils. Pacolet and Wedowee soils are mainly on hillsides. Wedowee and Vance soils are less red than the Cecil soils. Vance soils have a very firm and plastic subsoil.

Typical pedon of Cecil sandy loam, 2 to 6 percent slopes, in a wooded area, 0.4 mile east on Pierce Chapel Road from the intersection of Hamilton Road, 300 feet south of Pierce Chapel Church:

Ap—0 to 6 inches; yellowish red (5YR 4/6) sandy loam; weak fine granular structure; friable; many fine and very fine roots; strongly acid; abrupt smooth boundary.

B1—6 to 14 inches; yellowish red (5YR 4/6) sandy clay loam; moderate medium angular blocky structure; firm; many fine roots; few clay films on faces of peds; strongly acid; gradual wavy boundary.

B21t—14 to 22 inches; red (2.5YR 4/6) clay; strong medium angular blocky structure; very firm; few fine roots; few fine flakes of mica; few thin clay films on faces of peds; strongly acid; gradual wavy boundary.

B22t—22 to 36 inches; red (10R 4/6) clay; common medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; very firm; few thin clay films on faces of peds; few fine roots; strongly acid; gradual wavy boundary.

B3—36 to 52 inches; red (2.5YR 5/8) sandy clay loam; common medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few thin clay films on faces of peds; very strongly acid; gradual wavy boundary.

C1—52 to 63 inches; red (2.5YR 5/8) sandy clay loam; common medium distinct yellowish red (5YR 5/8) mottles; massive; friable; many fine flakes of mica; very strongly acid; gradual wavy boundary.

C2—63 to 80 inches; mottled yellowish red (5YR 5/8) and red (2.5YR 5/8) weathered granite that crushes to sandy loam; very strongly acid.

Solum thickness ranges from 40 to 60 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 5 to 10 inches thick. The Ap horizon has hue of 10YR or 5YR, value of 4 or 5, and chroma of 2 or 3; or it has hue of 10YR or 5YR, value of 5, and chroma of 4; or it has hue of 7.5YR, value of 4 or 5, and chroma of 2 or 4; or it has hue of 5YR, value of 4, and chroma of 3, 4, or 6. It is sandy loam or sandy clay loam.

The B1 horizon has hue of 5YR or 2.5YR, value of 4, and chroma of 6 or 8. The Bt horizon has hue of 2.5YR or 10R, value of 4 or 5, and chroma of 6 or 8. It is sandy clay or clay. Yellow and brown mottles are common in most pedons. The B3 horizon has hue of 2.5YR or 10R, value of 4 or 5, and chroma of 6 or 8. Mottles of high chroma are common in some pedons.

The C horizon is multicolored, but is mainly reddish. It is sandy clay loam or sandy loam.

Chastain series

The Chastain series consists of poorly drained, slowly permeable soils that formed mainly in clayey sediment. These soils are on flood plains of the Southern Coastal Plain. The water table commonly is at a depth of less than 1.0 foot from late in fall to late in spring. Slope is 0 to 2 percent.

Chastain soils are associated with Chewacla, Esto, and Susquehanna soils. Somewhat poorly drained Chewacla soils commonly are on somewhat higher lying flood plains and are in a fine loamy family. Well drained Esto soils and somewhat poorly drained Susquehanna soils are on uplands.

Typical pedon of Chastain loam, in a wooded area, 4.2 miles south on Moore Road from the junction with Chatsworth Road, and 0.5 mile east:

A1—0 to 4 inches; brown (10YR 5/3) loam; weak fine granular structure; very friable; many fine and very fine roots; strongly acid; clear smooth boundary.

B21g—4 to 16 inches; gray (10YR 6/1) silty clay loam; many fine distinct yellowish brown mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; few fine pores; strongly acid; gradual wavy boundary.

B22g—16 to 22 inches; light gray (10YR 7/2) silty clay loam; many fine distinct strong brown mottles; moderate medium subangular blocky structure; firm; few fine roots and pores; strongly acid; gradual wavy boundary.

B23g—22 to 36 inches; light gray (10YR 7/2) silty clay; many fine distinct strong brown mottles; moderate medium subangular blocky structure; firm; few fine flakes of mica; few fine roots and pores; strongly acid; gradual wavy boundary.

B24g—36 to 46 inches; gray (N 6/0) clay; few fine distinct strong brown mottles; moderate medium subangular blocky structure; very firm and plastic; few fine flakes of mica; strongly acid; gradual wavy boundary.

C—46 to 60 inches; gray (N 5/0) clay; common medium distinct olive (5Y 4/3) mottles; massive; extremely firm and plastic; strongly acid.

Solum thickness ranges from 40 to 60 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 4 to 12 inches thick. It has hue of 10YR or 5Y, value of 4 to 6, and chroma of 1 to 4; or it has hue of 2.5Y, value of 4 to 6, and chroma of 2 or 4. In some pedons, the A horizon is less than 6 inches thick, and it has value of 3.

The B horizon has hue of 10YR or 5Y, or it is neutral; it has value of 4 to 7, and chroma of 1 or 2; or it has hue of 2.5Y, value of 4 to 7, and chroma of 2. This horizon has brown, yellow, or reddish mottles. It is silty clay loam, silty clay, or clay.

The C horizon has textures and colors the same as or very similar to those in the B horizon. Some pedons have stratified or sandier material below a depth of 40 inches.

Chewacla series

The Chewacla series consists of somewhat poorly drained, moderately permeable soils that formed in thick alluvial sediment from uplands of the Southern Piedmont. These soils are on flood plains of the Southern Piedmont and Southern Coastal Plain. The water table commonly is at a depth of 0.5 foot to 1.5 feet from late in fall to the middle of spring. Slope is 0 to 2 percent.

Chewacla soils are associated with Chastain and Toccoa soils on the flood plains. Poorly drained Chastain soils commonly are lower lying, and well drained Toccoa soils commonly are somewhat higher lying.

Typical pedon of Chewacla loam, in a pasture, 10.0 miles north of Columbus, 0.1 mile south on Fortson Road from the intersection with Hubbard Road, and 330 feet east:

Ap—0 to 6 inches; dark brown (7.5YR 4/4) loam; weak fine granular structure; friable; common medium and fine roots; medium acid; abrupt smooth boundary.

B1—6 to 14 inches; reddish brown (5YR 4/3) sandy clay loam; few fine faint grayish brown mottles; weak medium subangular blocky structure; friable; few medium roots; few fine flakes of mica; many iron and manganese concretions; medium acid; abrupt smooth boundary.

B21g—14 to 23 inches; grayish brown (10YR 5/2) sandy clay loam; many medium faint dark brown (10YR 3/3) and few fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine manganese concretions; common fine roots; few fine flakes of mica; medium acid; clear wavy boundary.

B22—23 to 34 inches; yellowish brown (10YR 5/4) sandy clay loam; common medium faint yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine manganese concretions; few medium roots; few fine flakes of mica; medium acid; clear wavy boundary.

B3—34 to 60 inches; mottled yellowish brown (10YR 5/6), light yellowish brown (10YR 6/4), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/8) clay loam; weak medium subangular blocky structure; firm; few fine manganese concretions; strongly acid.

Solum thickness ranges from 36 to 72 inches. The soil is medium acid or strongly acid throughout except for the surface layer in limed areas. Flakes of mica are few or common in the B horizon of most pedons.

The A horizon is 6 to 10 inches thick. It has hue of 7.5YR, value of 3 or 4, and chroma of 2; or it has hue of 7.5YR, value of 4 or 5, and chroma of 4; or it has hue of 10YR, value of 3 or 4, and chroma of 3; or it has hue of 10YR, value of 4, and chroma of 2.

The B1 horizon has hue of 5YR, value of 4, and chroma of 3; or it has hue of 5YR, value of 5, and chroma of 4; or it has hue of 7.5YR, value of 4, and chroma of 2 or 4. It is sandy clay loam, loam, clay loam, or silty clay loam. The B2 horizon and B3 horizon have hue of 10YR, value of 5 or 6, and chroma of 2. They are silty clay loam, loam, or sandy clay loam.

Congaree series

The Congaree series consists of well drained or moderately well drained, moderately permeable soils that formed in thick alluvial sediment from uplands of the Southern Piedmont. These soils are on alluvial plains of the Southern Piedmont and Southern Coastal Plain. The water table commonly is at a depth of 2.5 to 4.0 feet from late in fall to the middle of spring. Slope is 0 to 2 percent.

Congaree soils are associated with Chewacla and Masada soils. Somewhat poorly drained Chewacla soils are on slightly lower lying flood plains. Well drained Masada soils are on stream terraces and have a clayey subsoil.

Typical pedon of Congaree loam, in a cultivated field, about 0.7 mile north on Lumpkin Road from the junction with Benning Road, 1.5 miles west on a field road, and 0.1 mile north of the field road:

Ap—0 to 10 inches; reddish brown (5YR 4/4) loam; weak fine granular structure; friable; many fine roots; slightly acid; gradual wavy boundary.

C1—10 to 20 inches; reddish brown (5YR 4/4) loam; massive; friable; few bedding planes; slightly acid; gradual wavy boundary.

C2—20 to 30 inches; dark brown (10YR 3/3) loam; massive; friable; slightly acid; gradual wavy boundary.

C3—30 to 43 inches; dark yellowish brown (10YR 3/4) loam; massive; friable; few fine flakes of mica; medium acid; gradual wavy boundary.

C4—43 to 60 inches; dark brown (7.5YR 4/4) fine sandy loam; massive; friable; common fine flakes of mica; medium acid.

Thickness of the sediment ranges from 60 to 72 inches or more. The soil is slightly acid or medium acid throughout.

The Ap horizon is 5 to 10 inches thick. It has hue of 5YR, value of 3 or 4, and chroma of 3 or 4; or it has hue of 7.5YR, value of 3, and chroma of 2; or it has hue of 7.5YR, value of 4, and chroma of 2 or 4.

The C horizon has hue of 5YR, value of 3 or 4, and chroma of 3 or 4; or it has hue of 7.5YR, value of 4 or 5, and chroma of 4; or it has hue of 7.5YR, value of 5, and chroma of 6; or it has hue of 10YR, value of 3 to 5, and

chroma of 3, 4, or 6. It is loam or fine sandy loam. Mottles, if present in the upper part of the C horizon, are common or many, dark reddish brown, and pale brown. Fine flakes of mica are few or common. In the lower part of this horizon, a few pedons have mottles that have chroma of 2 or less.

Dogue series

The Dogue series consists of moderately well drained soils. Permeability is moderately slow. These soils formed in mainly clayey fluvial sediments. They are on stream terraces slightly downstream from the uplands of the Southern Piedmont. The seasonal water table is at a depth of 2.0 to 3.0 feet from winter to the middle of spring. Slope is 1 to 2 percent.

Dogue soils are associated with Esto, Eunola, Masada, and Susquehanna soils. Well drained Esto soils are on uplands. Well drained Masada soils are on slightly higher lying stream terraces. Eunola soils are in a fine-loamy family. Somewhat poorly drained Susquehanna soils are on somewhat higher lying uplands and have montmorillonitic mineralogy.

Typical pedon of Dogue loam, 1 to 2 percent slopes, in a wooded area, 3.5 miles south of Victory Drive on South Lumpkin Road, and 50 feet east of the road:

A1—0 to 5 inches; brown (10YR 4/3) loam; moderate medium subangular blocky structure; friable; many fine and medium roots; slightly acid; gradual wavy boundary.

B21t—5 to 14 inches; yellowish brown (10YR 5/8) clay; few fine distinct yellowish red mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; thin discontinuous clay films on faces of peds; slightly acid; clear smooth boundary.

B22t—14 to 26 inches; mottled yellowish brown (10YR 5/8), light brownish gray (10YR 6/2), pale brown (10YR 6/3), and red (2.5YR 4/8) clay; moderate medium subangular blocky structure; very firm; few fine roots; thin discontinuous clay films on faces of peds; strongly acid; gradual wavy boundary.

B23t—26 to 41 inches; pale brown (10YR 6/3) clay; few fine faint grayish brown mottles, common medium faint yellowish brown (10YR 5/8) mottles, and few common distinct red (2.5YR 4/8) mottles; moderate medium subangular blocky structure parting to moderate fine angular blocky; very firm; thin discontinuous clay films on faces of peds; medium acid; gradual wavy boundary.

B24tg—41 to 60 inches; mottled grayish brown (10YR 5/2) and reddish yellow (7.5YR 6/8) clay; moderate medium angular blocky structure; very firm; thin discontinuous clay films on faces of peds strongly acid.

Solum thickness ranges from 60 to 80 inches or more. The soil is slightly acid to strongly acid throughout.

The A horizon is 4 to 12 inches thick. The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The A2 horizon, if present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6.

The upper part of the B horizon has hue of 10YR or 2.5YR, value of 4 to 6, and chroma of 4, 6, or 8. Few or common, fine or medium, gray mottles are within a depth of 24 inches. The number of mottles that have chroma of 2 or less increases with increasing depth. Typically, the lower part of the B horizon is mottled grayish, brownish, or reddish. The horizon is silty clay, silty clay loam, clay loam, or clay.

This soil is a taxadjunct to the Dogue series because it has slightly more silt throughout the pedon than is defined for the series. However, there is no significant difference in use and management of the soil.

Dothan series

The Dothan series consists of well drained soils. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. These soils formed in dominantly loamy marine sediment on uplands of the Southern Coastal Plain. Slope is 2 to 8 percent.

Dothan soils are associated with Ailey, Orangeburg, and Wagram soils on the upland. Ailey soils are arenic and have a firm, brittle layer in the subsoil. Orangeburg and Wagram soils do not contain plinthite. Orangeburg soils have a redder subsoil, and Wagram soils are arenic.

Typical pedon of Dothan loamy sand, 2 to 5 percent slopes, in a cultivated field, 8.0 miles northeast of Columbus, 0.8 mile southeast of the intersection of County Line Road and Midland Road, and 200 feet southwest of County Line Road:

Ap—0 to 8 inches; dark brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many fine roots; few fine nodules of ironstone; strongly acid; clear smooth boundary.

A2—8 to 12 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine roots; few fine nodules of ironstone; strongly acid; gradual smooth boundary.

B21t—12 to 26 inches; strong brown (7.5YR 5/6) sandy clay loam; few common faint strong brown (7.5YR 5/8) mottles in the lower part; weak medium subangular blocky structure; friable; common fine roots; few fine nodules of ironstone; patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

B22t—26 to 36 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots and pores; few fine nodules of ironstone; patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B23t—36 to 50 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct strong

brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; common fine pores; 5 percent plinthite; patchy clay films on faces of peds; few fine nodules of ironstone; very strongly acid; gradual smooth boundary.

B24t—50 to 58 inches; mottled light yellowish brown (10YR 6/4), red (2.5YR 5/8), brown (7.5YR 5/4), and strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; common fine pores; patchy clay films on faces of peds; about 10 percent plinthite; very strongly acid; gradual smooth boundary.

B25t—58 to 62 inches; mottled light yellowish brown (10YR 6/4), red (2.5YR 5/8), light gray (10YR 7/2), brown (7.5YR 5/4), and strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; common fine pores; patchy clay films on faces of peds; 10 percent plinthite; very strongly acid.

Solum thickness ranges from 60 to 72 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Depth to horizons with plinthite content of 5 to 10 percent ranges from 26 to 60 inches.

The A horizon is 8 to 18 inches thick. The Ap horizon and A2 horizon have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. Nodules of ironstone range from 2 to 4 percent, by volume, in the A horizon.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 6 or 8; or it has hue of 2.5YR, value of 6 or 7, and chroma of 6 or 8; or it has hue of 2.5YR, value of 5, and chroma of 6. It is dominantly sandy clay loam but ranges to sandy loam. The lower part of the Bt horizon includes many medium and coarse strong brown, yellow, red, yellowish red, and gray mottles. Nodules of ironstone make up 5 percent or less of the upper part of the Bt horizon. Content of plinthite is 5 percent or more in the lower part of the Bt horizon.

Esto series

The Esto series consists of well drained, slowly permeable soils that formed in dominantly clayey marine sediment. These soils are on uplands of the Southern Coastal Plain. Slope is 2 to 25 percent.

Esto soils are associated with Dothan, Orangeburg, and Susquehanna soils on the upland. Dothan and Orangeburg soils are in a fine-loamy family. Dothan soils have more than 5 percent plinthite within a depth of 60 inches, and Orangeburg soils do not have light gray mottles in the subsoil. Somewhat poorly drained Susquehanna soils have a subsoil that is very firm and very plastic.

Typical pedon of Esto sandy loam, 2 to 5 percent slopes, in an old field, 10.0 miles northeast of Columbus, 0.6 mile northeast on Fulton Road from the intersection with Macon Road, and 200 feet south of the road:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; common fine and very fine roots; few nodules of ironstone; strongly acid; abrupt wavy boundary.

A2—5 to 9 inches; yellowish brown (10YR 5/6) sandy loam; weak fine granular structure; very friable; few fine roots; strongly acid; abrupt wavy boundary.

B21t—9 to 31 inches; yellowish red (5YR 5/6) sandy clay; few medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; common fine roots; clay films on faces of peds; strongly acid; abrupt wavy boundary.

B22t—31 to 50 inches; mottled strong brown (7.5YR 5/8), yellowish brown (10YR 5/4), yellowish red (5YR 5/8), red (2.5YR 4/6), and light brown (7.5YR 6/4) clay; moderate medium subangular blocky structure; very firm; few very fine and fine roots; clay films on faces of peds; strongly acid; clear wavy boundary.

B23t—50 to 62 inches; mottled yellowish brown (10YR 5/4), red (2.5YR 4/6), strong brown (7.5YR 5/8), and light gray (10YR 7/2) clay; moderate medium subangular blocky structure; very firm; clay films on faces of peds; few quartz pebbles; very strongly acid; clear wavy boundary.

The solum is more than 65 inches thick. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 4 to 9 inches thick. The Ap horizon is sandy loam or loamy sand and has hue of 10YR, value of 3 to 4, and chroma of 1 or 2. If present, nodules of ironstone range from 1 to 3 percent. The A2 horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 3, 4, 6, or 8.

The B1 horizon, if present, has hue of 10YR, value of 5, and chroma of 4 or 6; or it has hue of 7.5YR, value of 6, and chroma of 6 or 8. The upper part of the Bt horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8; or it has hue of 10YR, value of 6, and chroma of 6 or 8; or it has hue of 7.5YR, value of 5, and chroma of 6 or 8; or it has hue of 5YR, value of 5 or 6, and chroma of 6 or 8. The middle and lower parts of the Bt horizon include many medium and coarse gray, red, yellow, and brown mottles, or they are mottled with these colors. The Bt horizon is clay or sandy clay.

Eunola series

The Eunola series consists of moderately well drained, moderately permeable soils that formed in loamy marine sediment. These soils are on low lying stream terraces of the Southern Coastal Plain. The water table is at a depth of 1.5 to 2.5 feet from late in fall to late in winter. Slope is 0 to 3 percent.

Eunola soils are associated with well drained Dothan, Troup, and Wagram soils on the upland. Dothan soils have a subsoil that contains plinthite, Troup soils are grossarenic, and Wagram soils are arenic.

Typical pedon of Eunola sandy loam, 0 to 3 percent slopes, in a wooded area, 0.2 mile southwest of the junction of Moore Road and Buena Vista Road, on the Fort Benning Military Reservation:

A1—0 to 9 inches; very dark grayish brown (10YR 3/2) sandy loam; weak fine granular structure; very friable; many fine, very fine, and medium roots; strongly acid; clear wavy boundary.
B1—9 to 18 inches; light yellowish brown (10YR 6/4) sandy loam; weak fine granular structure; very friable; many fine and very fine roots and few medium roots; strongly acid; gradual wavy boundary.
B21t—18 to 26 inches; brownish yellow (10YR 6/6) sandy clay loam; few medium faint pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.
B22t—26 to 52 inches; yellowish brown (10YR 5/6) sandy clay loam; few fine distinct red, few medium distinct light gray (10YR 7/2), and few medium faint strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; few patchy clay films on faces of peds; few clean coarse sand grains; very strongly acid; gradual wavy boundary.
B3—52 to 60 inches; mottled yellowish brown (10YR 5/8), light gray (10YR 7/2), strong brown (7.5YR 5/8), and yellowish red (5YR 5/6) sandy loam; weak fine granular structure; very friable; very strongly acid.

Solum thickness ranges from 60 to 70 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A1 horizon is 5 to 9 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 to 3. The A2 horizon, if present, has hue of 10YR, value of 4 or 5, and chroma of 4; or hue of 10YR, value of 6, and chroma of 3 or 4.

The B1 horizon has hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8; or hue of 10YR, value of 7, and chroma of 4. It is sandy loam or fine sandy loam. The upper part of the B2t horizon has hue of 7.5YR or 10YR, value of 5, and chroma of 6 or 8; or hue of 10YR, value of 5, and chroma of 3 or 4; or hue of 10YR, value of 6, and chroma of 6. Mottles are reddish, brownish, or grayish. The lower part of the B2t horizon is mottled red, brown, yellow, and gray. It is sandy clay loam or sandy clay. The B3 horizon is similar in color to the lower part of the B2t horizon. It is sandy loam or sandy clay loam.

Fuquay series

The Fuquay series consists of well drained soils that have moderate permeability in the upper part of the subsoil and slow permeability in the lower part. These soils formed in sandy and loamy marine sediment on uplands of the Southern Coastal Plain. Slope is 5 to 12 percent.

Fuquay soils are associated with Ailey and Esto soils on the upland. The associated soils do not have plinthite in the subsoil. Ailey soils have a firm, brittle, and weakly cemented layer in the subsoil. Esto soils have an A horizon less than 12 inches thick and are in a clayey family.

Typical pedon of Fuquay loamy sand, in an area of Esto, Fuquay, and Ailey loamy sands, 5 to 12 percent slopes, in a wooded area, 0.25 mile north of the intersection of Mote Road and Steam Mill Road, and 400 feet east of Mote Road on the Fort Benning Military Reservation:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; few nodules of ironstone; strongly acid; abrupt smooth boundary.
A2—7 to 26 inches; brownish yellow (10YR 6/6) loamy sand; weak fine granular structure; very friable; many fine roots; few nodules of ironstone; very strongly acid; clear wavy boundary.
B1—26 to 34 inches; yellowish brown (10YR 5/8) sandy loam; weak fine subangular blocky structure; very friable; few fine roots; few nodules of ironstone; very strongly acid; clear wavy boundary.
B21t—34 to 45 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few nodules of ironstone; common fine pores; few patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.
B22t—45 to 80 inches; yellowish brown (10YR 5/8) sandy clay loam; many coarse prominent red (2.5YR 4/6) mottles and common medium distinct light gray (10YR 7/2) mottles; weak medium subangular blocky structure; firm; common fine pores; about 10 percent nodular plinthite; few patchy clay films on faces of peds; very strongly acid.

Solum thickness is 80 to 90 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas. Depth to plinthite ranges from 45 to 60 inches.

The A horizon is 20 to 40 inches thick. If present, nodules of ironstone are few. The Ap horizon or A1 horizon has hue of 10YR, value of 4, and chroma of 1 or 2. The A2 horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 4 or 6.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8. The lower part of the Bt horizon includes common, medium and coarse, brown, red, and gray mottles. Plinthite content ranges from 5 to 12 percent in the lower part of the Bt horizon. Few or common nodules of ironstone are in the upper part of the Bt horizon.

Hiwassee series

The Hiwassee series consists of well drained, moderately permeable soils that formed in material weathered from mixed acidic and basic crystalline rocks. These soils are on uplands of the Southern Piedmont. Slope is 2 to 6 percent.

Hiwassee soils are associated with Cecil, Pacolet, and Vance soils on the uplands. Cecil and Pacolet soils are less red throughout. Vance soils are brownish and have a more firm and plastic B horizon.

Typical pedon of Hiwassee loam, 2 to 6 percent slopes, in a wooded area, 10.0 miles northeast of Columbus, 0.3 mile east on Jackson Road from the junction with Lynch Road, and 0.5 mile south on a woods road:

Ap—0 to 7 inches; dark reddish brown (5YR 3/3) loam; weak fine granular structure; friable; many fine and medium roots; medium acid; clear smooth boundary.

B21t—7 to 17 inches; dark reddish brown (2.5YR 3/4) clay loam; moderate medium subangular blocky structure; few iron and manganese concretions; firm; patchy clay films on faces of peds; few fine roots; medium acid; gradual wavy boundary.

B22t—17 to 40 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm; few fine roots; patchy clay films on faces of peds; medium acid; gradual wavy boundary.

B3—40 to 62 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; patchy clay films on faces of peds; strongly acid.

Solum thickness is 40 to 60 inches or more. The soil is medium acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 6 to 8 inches thick. It has hue of 10R or 5YR, value of 3, and chroma of 2 to 4; or it has hue of 2.5YR, value of 3, and chroma of 2 or 4; or it has hue of 2.5YR, value of 2, and chroma of 4.

The Bt horizon above a depth of 40 inches has hue of 10R or 2.5YR, value of 3, and chroma of 4 or 6. The Bt horizon below a depth of 40 inches has hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Few or common strong brown mottles are in the lower part of some pedons. The B3 horizon has hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 or 8. There are few or common brownish mottles. This horizon is clay loam or sandy clay loam.

Lakeland series

The Lakeland series consists of excessively drained, very rapidly permeable soils that formed in sandy marine sediment. These soils are on uplands of the Sand Hills. Slope is 5 to 25 percent.

Lakeland soils are associated with the well drained Ailey, Troup, Vaucluse, and Wagram soils on the upland. Ailey and Vaucluse soils have a firm, brittle, and weakly cemented layer in the subsoil. Ailey and Wagram soils are arenic. Troup soils are grossarenic.

Typical pedon of Lakeland sand, 10 to 25 percent slopes, in a wooded area, 0.5 mile south of the intersection of Schatulga Road and Mote Road, and 375 feet west of Mote Road:

A1—0 to 7 inches; brown (10YR 4/3) sand; single grained; loose; many fine roots; strongly acid; clear wavy boundary.

C1—7 to 13 inches; pale brown (10YR 6/3) sand; single grained; loose; common fine roots; strongly acid; gradual wavy boundary.

C2—13 to 36 inches; yellowish brown (10YR 5/8) sand; few medium faint pale brown (10YR 6/3) streaks of clean sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

C3—36 to 80 inches; yellowish brown (10YR 5/8) sand; few fine distinct yellowish red mottles and few fine faint pale brown mottles; single grained; loose; few fine roots in the upper part; very strongly acid.

Thickness of the sand or fine sand is 80 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 4 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2; or hue of 10YR, value of 4, and chroma of 3.

The C horizon has hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8; or it has hue of 10YR, value of 5 to 7, and chroma of 4, 6, or 8; or it has hue of 10YR, value of 6, and chroma of 3.

Masada series

The Masada series consists of well drained, moderately permeable soils that formed in clayey sediment. These soils commonly are on stream terraces between soils on the lower lying flood plain and soils on the higher uplands of the Southern Piedmont and Southern Coastal Plain. Slope is 0 to 3 percent.

Masada soils are associated with Chewacla, Dogue, Toccoa, and Wickham soils. Somewhat poorly drained Chewacla soils are on flood plains and are in a fine-loamy family. Moderately well drained Dogue soils are on slightly lower lying stream terraces. Toccoa soils are on flood plains and are in a coarse-loamy family. Wickham soils commonly are on higher lying stream terraces and are in a fine-loamy family.

Typical pedon of Masada fine sandy loam, 0 to 3 percent slopes, in an abandoned field south of Columbus, 0.4 mile south of the intersection of Victory Drive and South Lumpkin Road, and 1.0 mile west of South Lumpkin Road:

A1—0 to 3 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; many fine

and medium roots; few fine flakes of mica; strongly acid; gradual wavy boundary.
A2—3 to 10 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; strongly acid; gradual wavy boundary.
B1—10 to 17 inches; strong brown (7.5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; thin patchy clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.
B21t—17 to 25 inches; yellowish red (5YR 5/6) sandy clay; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; common fine flakes of mica; strongly acid; gradual wavy boundary.
B22t—25 to 46 inches; yellowish red (5YR 5/8) clay; few fine distinct dark yellowish brown mottles; moderate medium subangular blocky structure; very firm; common fine flakes of mica; strongly acid; gradual wavy boundary.
B3—46 to 54 inches; strong brown (7.5YR 5/6) clay loam; few fine distinct dark yellowish brown mottles; moderate medium subangular blocky structure; firm; strongly acid; gradual wavy boundary.
C—54 to 60 inches; strong brown (7.5YR 5/6) sandy loam; massive; very friable; strongly acid.

Solum thickness ranges from 40 to 60 inches. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 4 to 12 inches thick. The A1 horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. The Ap horizon, if present, has hue of 10YR, value of 4 or 5, and chroma of 3, 4, or 6. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3, 4, 6, or 8; or it has hue of 2.5Y, value of 5 or 6, and chroma of 4, 6, or 8.

The B1 horizon has hue of 5YR, 7.5YR, or 10YR; value of 5 or 6; and chroma of 4, 6, or 8. It is sandy clay loam, clay loam, or loam. The B2t horizon has hue of 10YR, 7.5YR, or 5YR; value of 4 or 5; and chroma of 6 or 8. It is sandy clay, clay loam, or clay. The B3 horizon has colors similar to those of the Bt horizon. It is sandy clay loam, clay loam, or sandy clay.

The C horizon has hue of 5YR, 7.5YR, or 10YR; value of 5, 6, or 8; and chroma of 4, 6, or 8. If present, mottles have high chroma. The C horizon is sandy loam or sandy clay loam.

This soil is a taxadjunct to the Masada series because the silt content is slightly higher in the texture control section than is defined for the series. However, there is no significant difference in use and management of the soil.

Orangeburg series

The Orangeburg series consists of well drained, moderately permeable soils that formed dominantly in loamy marine sediment. These soils are on uplands of the Southern Coastal Plain. Slope is 2 to 8 percent.

Orangeburg soils are associated with Dothan, Esto, and Troup soils on the upland. Dothan soils have 5 percent or more plinthite in the Bt horizon; in addition, the subsoil is less red. Esto soils are in a clayey family. Troup soils are grossarenic.

Typical pedon of Orangeburg sandy loam, 5 to 8 percent slopes, in an area of Orangeburg-Urban land complex, 2 to 8 percent slopes, in an area of planted loblolly pine on Fort Benning Military Reservation, 1.0 mile south of St. Marys Road, and 0.5 mile west of Tiger Creek:

Ap—0 to 8 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; few very fine roots; very strongly acid; clear wavy boundary.
B1—8 to 13 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; very friable; few fine roots; very strongly acid; gradual wavy boundary.
B21t—13 to 46 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; few patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.
B2t—46 to 62 inches; yellowish red (5YR 4/6) sandy clay loam; few fine faint yellowish brown mottles; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; very strongly acid.

Solum thickness ranges from 60 to 72 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 5 to 20 inches thick. The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4; or hue of 10YR or 7.5YR, value of 5, and chroma of 6. The A2 horizon, if present, has hue of 10YR, value of 5, and chroma of 4 or 6. The Ap horizon is loamy sand or sandy loam.

The B1 horizon has hue of 10YR or 5YR, value of 5, and chroma of 6 or 8; or it has hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8. The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. The Bt horizon commonly is sandy clay loam but ranges to sandy clay in the lower part. In some pedons, the lower part of the B horizon has hue of 7.5YR, value of 5, and chroma of 6 or 8. Mottles, if present, are in the lower part of the B horizon and commonly are brownish.

Pacolet series

The Pacolet series consists of well drained, moderately permeable soils that formed in material weathered mainly from granite and gneiss. These soils are on uplands of the Southern Piedmont. Slope is 2 to 25 percent.

Pacolet soils are associated with Cecil, Vance, and Wedowee soils on the uplands. Cecil soils commonly are

on broader and smoother ridgetops and less sloping hillsides; also, they have a thicker solum. Wedowee and Vance soils are less red. Vance soils have a plastic subsoil.

Typical pedon of Pacolet sandy clay loam, 10 to 15 percent slopes, eroded, in a wooded area, 0.6 mile east on County Line Road from the intersection with Midland Road, and 150 feet south of the road:

Ap—0 to 6 inches; yellowish red (5YR 5/8) sandy clay loam; weak fine subangular blocky structure; very friable; many fine and medium roots; common quartz gravel; strongly acid; abrupt smooth boundary.

B1—6 to 11 inches; yellowish red (5YR 5/8) clay loam; weak medium subangular blocky structure; firm; few fine roots; few quartz pebbles; medium acid; clear wavy boundary.

B2t—11 to 26 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; firm; few fine roots; few quartz pebbles; common fine flakes of mica; discontinuous clay films on faces of peds; strongly acid; gradual wavy boundary.

B3—26 to 36 inches; red (2.5YR 4/8) sandy clay loam; few fine prominent strong brown (7.5YR 5/8) mottles; moderate fine subangular blocky structure; friable; few fine roots; few quartz pebbles; common fine flakes of mica; strongly acid; clear wavy boundary.

C—36 to 60 inches; red (2.5YR 4/8) sandy loam; few fine prominent reddish yellow mottles; massive; friable; strongly acid.

Solum thickness ranges from 20 to 40 inches. The soil is medium acid to very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 1 to 7 inches thick. It has hue of 10YR or 5YR, value of 4 or 5, and chroma of 2 to 4; or it has hue of 7.5YR, value of 4 or 5, and chroma of 2 or 4. It is sandy clay loam or sandy loam. The A2 horizon, if present, and eroded pedons have hue of 10YR to 5YR, value of 4 or 5, and chroma of 4, 6, or 8.

The B1 horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. The Bt horizon has hue of 2.5YR, value of 4 or 5, and chroma of 6 or 8. The Bt horizon is clay, clay loam, or sandy clay. The B3 horizon has hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 or 8. It is mottled reddish, brownish, or yellowish. The B3 horizon is clay loam, sandy clay loam, or sandy loam.

The C horizon is mottled reddish, brownish, yellowish, and white. It is sandy clay loam, fine sandy loam, or sandy loam.

Pelham series

The Pelham series consists of poorly drained, moderately permeable soils that formed in sandy and loamy sediment. These soils are on narrow flood plains and in depressional areas on uplands of the Southern Coastal Plain. They are commonly flooded for brief periods from early in winter to early in spring. The water table commonly is at a depth of 0.5 foot to 1.5 feet from the middle of winter to the middle of spring. Slope is 0 to 2 percent.

Pelham soils are associated with Ailey, Lakeland, Troup, Vaucluse, and Wagram soils on the uplands, and with Bibb, Chewacla, and Toccoa soils on the flood plains. Well drained Ailey and Vaucluse soils have a firm, brittle, and weakly cemented layer in the subsoil. Well drained Troup soils are grossarenic. Excessively drained Lakeland soils are sandy throughout. Wagram soils are well drained. Poorly drained Bibb soils, somewhat poorly drained Chewacla soils, and well drained Toccoa soils are not arenic.

Typical pedon of Pelham loamy sand, in a wooded area, 2.5 miles southeast of the junction of Chatsworth Road and the Tenth Armored Division Road, on Fort Benning Military Reservation:

A1—0 to 5 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; very friable; many very fine roots; very strongly acid; clear wavy boundary.

A2—5 to 23 inches; gray (10YR 6/1) loamy sand; common fine distinct yellowish brown mottles; weak fine granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

B1g—23 to 35 inches; gray (10YR 6/1) sandy loam; few fine faint light yellowish brown mottles; weak fine subangular blocky structure; very friable; few fine roots; very strongly acid; gradual wavy boundary.

B21tg—35 to 54 inches; gray (10YR 6/1) sandy clay loam; common fine faint light yellowish brown mottles; weak fine subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

B22t—54 to 72 inches; mottled light yellowish brown (10YR 6/4) and gray (10YR 6/1) sandy clay loam that has pockets of sandy clay; moderate medium subangular blocky structure; firm; very strongly acid.

Solum thickness is 60 to 80 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 20 to 40 inches thick. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 1; or it is neutral and has value of 3 or 4. The A2 horizon has hue of 10YR or 5Y, value of 5 to 7, and chroma of 1 or 2.

The B21t horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2; or it is neutral and has value of 5 to 7. Mottles that have high chroma are few or common in most pedons. This horizon is sandy loam or sandy clay loam. The B22t horizon has colors similar to the B21t horizon; or it has hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8. The B22t horizon has common or many gray mottles.

Pelion series

The Pelion series consists of moderately well drained soils that formed predominately in loamy sediment. Permeability is moderately slow. These soils are on the lower sides of uplands in the Sand Hills and receive seepage from higher lying soils. The water table commonly is at a depth of 1.0 foot to 2.5 feet from late in fall to the middle of spring. Slope is 8 to 15 percent.

Pelion soils are associated with Vaucluse and Troup soils on the uplands. Well drained Vaucluse soils and Troup soils are on the middle and upper part of the hillsides. Vaucluse soils have a layer in the subsoil that is firm, brittle, and weakly cemented. Troup soils are grossarenic.

Typical pedon of Pelion loamy sand, in an area of Troup, Vaucluse, and Pelion loamy sands, 8 to 15 percent slopes, in a wooded area, 1.9 miles northwest of the junction of Moore Road and Buena Vista Road, on the Fort Benning Military Reservation:

A1—0 to 3 inches; dark gray (10YR 4/1) loamy sand; weak fine granular structure; very friable; many very fine to medium roots; strongly acid; clear wavy boundary.

A2—3 to 6 inches; pale brown (10YR 6/3) loamy sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

B1—6 to 18 inches; yellowish brown (10YR 5/6) sandy loam; common medium faint strong brown (7.5YR 5/8) and pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; very friable; many fine and very fine roots and few medium roots; strongly acid; clear wavy boundary.

B21t—18 to 36 inches; yellowish brown (10YR 5/6) sandy clay loam; few medium faint light brownish gray (10YR 6/2) mottles and few medium distinct strong brown (7.5YR 5/6) and red (2.5YR 4/6) mottles; subangular blocky structure; yellowish brown and light brownish gray parts are friable, and the strong brown and red parts are firm and brittle; sand grains coated and bridged with clay; few fine roots; strongly acid; gradual wavy boundary.

B22t—36 to 54 inches; mottled yellowish brown (10YR 5/8), light gray (10YR 7/2), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/8) sandy clay loam that has pockets of sandy clay and sandy loam; subangular blocky structure; firm; the strong brown part is slightly brittle; few fine and medium roots; few patchy clay films on faces of peds; few clean coarse sand grains; strongly acid; gradual wavy boundary.

B3—54 to 60 inches; light gray (10YR 7/2) sandy clay loam; common medium faint pale brown (10YR 6/3) and yellowish brown (10YR 5/8) mottles and common fine distinct reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable; strongly acid.

Solum thickness ranges from 40 to 70 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 6 to 17 inches thick. The A1 horizon is 3 to 5 inches thick and has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The A2 horizon is 3 to 12 inches thick and has hue of 10YR, value of 5 to 7, and chroma of 2 to 4; or it has hue of 2.5, value of 6, and chroma of 2.

The B1 horizon has hue of 10YR, value of 5 or 6, and chroma of 3, 4, or 6; or it has hue of 2.5Y, value of 6, and chroma of 4. The B2t horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 6 or 8. The B2t horizon has medium or coarse brown, red, and gray mottles; the gray mottles are in the upper 10 inches of the horizon. The B2t horizon is mainly sandy clay loam, but the lower part ranges to sandy clay in some pedons. The B3 horizon has hue of 10YR, value of 5 to 7, and chroma of 1, 2, 4, 6, or 8; or it is mottled gray, brown, and red. It is sandy loam or sandy clay loam.

Stilson series

The Stilson series consists of moderately well drained, moderately permeable soils that formed in sandy and loamy marine sediment. These soils are on uplands of the Southern Coastal Plain. The water table is perched at a depth of 2.5 to 3.0 feet from early in winter to the middle of spring. Slope is 0 to 3 percent.

Stilson soils are associated with the well drained Ailey, Dothan, Troup, and Wagram soils on the uplands. Ailey soils have a firm, brittle, and weakly cemented layer in the subsoil. Dothan soils have a sandy A horizon that is less than 20 inches thick. Troup soils are grossarenic. Wagram soils contain less than 5 percent plinthite in the B horizon.

Typical pedon of Stilson loamy sand, 0 to 3 percent slopes, in a pecan grove, about 2.0 miles southwest on Macon Road from the junction with Schatulga Road, and 0.6 mile north of Macon Road:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; few nodules of ironstone; common fine and medium roots; strongly acid; clear smooth boundary.

A21—6 to 24 inches; pale yellow (2.5Y 7/4) loamy sand; weak fine granular structure; very friable; few nodules of ironstone; common fine and medium roots; strongly acid; clear smooth boundary.

A22—24 to 30 inches; pale yellow (2.5Y 7/4) loamy sand; few fine faint pale brown mottles; weak fine granular structure; very friable; few nodules of ironstone; few fine roots; strongly acid; gradual wavy boundary.

B1—30 to 36 inches; yellow (2.5Y 7/6) sandy loam; few fine faint light brownish gray mottles; weak fine subangular blocky structure; very friable; few nodules of ironstone; few fine roots; strongly acid; gradual wavy boundary.

B21t—36 to 48 inches; brownish yellow (10YR 6/6) sandy loam; weak medium subangular blocky structure; friable; few nodules of ironstone; about 3 percent plinthite; strongly acid; gradual wavy boundary.
B22t—48 to 55 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm; 5 to 10 percent plinthite; strongly acid; gradual smooth boundary.
B23t—55 to 64 inches; mottled strong brown (7.5YR 5/8), brownish yellow (10YR 6/6), and light gray (10YR 7/2) sandy clay loam; moderate coarse angular blocky structure; firm; 10 percent plinthite; strongly acid, gradual smooth boundary.
B24t—64 to 72 inches; mottled reddish yellow (7.5YR 6/8), strong brown (7.5YR 5/8), brownish yellow (10YR 6/6), and light gray (10YR 7/2) sandy clay loam; moderate coarse angular blocky structure; firm and slightly brittle; 5 percent plinthite; few patchy clay films on faces of peds; very strongly acid.

Solum thickness ranges from 70 to 80 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

The Ap horizon is 4 to 7 inches thick. It has hue of 10YR, value of 3, and chroma of 1; or hue of 10YR, value of 4, and chroma of 2. The A2 horizon has hue of 2.5Y, value of 5 or 6, and chroma of 4 or 6; or hue of 2.5Y, value of 7, and chroma of 4. A few nodules of ironstone commonly are in the surface layer and throughout the A2 horizon.

The B1 horizon has hue of 10YR, value of 5 or 6, and chroma of 6 or 8; or it has hue of 2.5Y, value of 6, and chroma of 4 or 6; or it has hue of 2.5Y, value of 7, and chroma of 6 or 8. The upper part of the Bt horizon has hue of 10YR, value of 6, and chroma of 6 or 8; or hue of 10YR, value of 7, and chroma of 6. Gray mottles commonly are at a depth of 5 to 14 inches below the top of the argillic horizon. The lower part of the Bt horizon has a matrix color similar to that of the upper part of the Bt horizon and has red, brown, yellow, and gray mottles. Some pedons are mottled with these colors. Plinthite is 5 to 15 percent in the lower part of the Bt horizon.

Susquehanna series

The Susquehanna series consists of somewhat poorly drained soils that formed in clayey marine sediment. Permeability is very slow. These soils are on uplands of the Southern Coastal Plain. Although Susquehanna soils remain wet for long periods after high rainfall, they do not have a seasonally high water table. Slope is 2 to 8 percent.

Susquehanna soils are associated with well drained Esto, Troup, and Wagram soils on the uplands. Troup soils are grossarenic, and Wagram soils are arenic.

Typical pedon of Susquehanna sandy loam, 2 to 5 percent slopes, in a pasture, 0.25 mile north of Macon Road on Garrett Road, and 100 feet west of the road:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; few fine and medium roots; slightly acid; clear smooth boundary.
A2—5 to 9 inches; light yellowish brown (10YR 6/4) sandy loam; few fine faint yellowish brown mottles; weak fine subangular blocky structure; very friable; few fine and medium roots; slightly acid; gradual wavy boundary.
B21t—9 to 17 inches; strong brown (7.5YR 5/6) clay loam; common fine distinct red mottles and common medium faint light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; strong medium subangular blocky structure; very firm, very plastic; few fine and medium roots; continuous thin clay films on faces of most peds; medium acid; clear wavy boundary.
B22t—17 to 44 inches; light gray (10YR 7/1) clay; common fine and medium distinct yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) mottles; strong medium subanuglar blocky structure; very firm, very plastic; few fine roots; continuous clay films on faces of peds; strongly acid; gradual wavy boundary.
B23t—44 to 56 inches; light gray (10YR 6/1) clay; few fine distinct yellowish brown and strong brown mottles; strong medium angular and subangular blocky structure; very firm, very plastic; few fine roots; continuous clay films on faces of peds; very strongly acid; gradual wavy boundary.
B24t—56 to 62 inches; mottled gray (10YR 5/1), yellowish brown (10YR 5/8), strong brown (7.5YR 5/8), and red (10R 5/6) clay; strong medium angular and subangular blocky structure; very firm, very plastic; many very fine flakes of mica; continuous clay films on faces of peds; very strongly acid.

Solum thickness ranges from 60 to 70 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer and subsurface layer in limed areas.

The A1 horizon has hue of 10YR, value of 3, and chroma of 1; or hue of 10YR, value of 4, and chroma of 1 or 2. The Ap horizon and A2 horizon have hue of 10YR, value of 4 to 6, and chroma of 2 to 4 or 6.

The upper part of the Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4, 6, or 8; or it has hue of 7.5YR, value of 5, and chroma of 6. Red and brown mottles are few or common. The matrix color of the lower part of the Bt horizon has hue of 10YR or 5Y, value of 4 to 7, and chroma of 1 or 2; or it has hue of 2.5Y, value of 4 to 7, and chroma of 2. Red and brown mottles are few to many. In some pedons, the lower part of the Bt horizon has no matrix color and is mottled red, brown, and gray. The Bt horizon is clay or clay loam.

Toccoa series

The Toccoa series consists of well drained soils that formed in alluvial sediment from uplands of the Southern Piedmont. Permeability is moderately rapid. These soils are on flood plains that drain from the Southern Piedmont. The water table commonly is at a depth of 2.5 to 5.0 feet from early in winter to the middle of spring. Slope is 0 to 2 percent.

Toccoa soils are associated with Bibb and Chewacla soils on the flood plains. Poorly drained Bibb soils and somewhat poorly drained Chewacla soils commonly are lower lying. Chewacla soils are in a fine-loamy family.

Typical pedon of Toccoa sandy loam, in a pasture, 0.3 mile north on River Road from the intersection with Biggers Road, and 150 feet east:

Ap—0 to 8 inches; brown (7.5YR 4/4) sandy loam; weak fine granular structure; very friable; many fine and very fine roots; common fine flakes of mica; slightly acid; clear smooth boundary.

C1—8 to 17 inches; brown (7.5YR 4/4) sandy loam; massive; very friable; many very fine roots; common fine flakes of mica, slightly acid; clear wavy boundary.

C2—17 to 29 inches; reddish brown (5YR 4/4) sandy loam; massive; very friable; few very fine roots; common fine flakes of mica; slightly acid; clear wavy boundary.

C3—29 to 43 inches; dark brown (10YR 4/3) sandy loam; massive; friable; common fine flakes of mica; medium acid; clear wavy boundary.

C4—43 to 60 inches; dark brown (10YR 4/3) sandy loam; few common faint dark yellowish brown (10YR 4/6), light gray (10YR 7/2), and brownish yellow (10YR 6/6) mottles; massive; friable; common fine flakes of mica; few lenses of loamy sand; medium acid.

Thickness of the sediment ranges from 30 to 72 inches or more. The soil is slightly acid to strongly acid throughout except for the surface layer in limed areas. Bedding planes are few or common in the upper part of the C horizon. Flakes of mica are common or many throughout the A horizon and C horizon.

The A horizon is 8 to 12 inches thick. It has hue of 10YR or 5YR, value of 4, and chroma of 3 or 4: or it has hue of 7.5YR, value of 4, and chroma of 4.

The C horizon has hue of 5YR, value of 4, and chroma of 3 or 4: or it has hue of 5YR, value of 5, and chroma of 4; or it has hue of 10YR, value of 4, and chroma of 2 to 4; or it has hue of 10YR, value of 5, and chroma of 3, 4, or 6. The C horizon commonly has brown, gray, or yellow mottles below a depth of 40 inches. Above a depth of 40 inches, the C horizon is predominately sandy loam, but thin strata of loamy sand are in some pedons. In some pedons, commonly below a depth of 40 inches, strata are gravelly or very gravelly loamy sand, fine sandy loam, or sandy clay loam.

Troup series

The Troup series consists of well drained soils that have a moderately permeable subsoil. These soils formed in thick, sandy and loamy marine sediment. They are on uplands of the Southern Coastal Plain. Slope is 2 to 25 percent.

Troup soils are associated with Ailey, Lakeland, Orangeburg, Vaucluse, Pelion, and Wagram soils on the uplands. Ailey and Vaucluse soils have a firm, brittle, weakly cemented layer in the subsoil. Pelion, Orangeburg, and Vaucluse soils have an A horizon that is less than 20 inches thick. In addition, Pelion soils have gray mottles in the subsoil. Ailey and Wagram soils are arenic.

Typical pedon of Troup loamy fine sand, 5 to 8 percent slopes, in a wooded area on Fort Benning Military Reservation, 1.75 miles south on the 10th Armored Division Road from the junction of Chatsworth Road, 0.3 mile west on a woods road, and 30 feet north:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) loamy fine sand; single grained; loose; many fine and medium roots; very strongly acid; abrupt smooth boundary.

A21—5 to 20 inches; yellowish brown (10YR 5/4) loamy fine sand; single grained; loose; many fine and medium roots; very strongly acid; gradual wavy boundary.

A22—20 to 48 inches; yellowish brown (10YR 5/8) loamy fine sand; single grained; loose; few fine roots; very strongly acid; gradual smooth boundary.

B2t—48 to 64 inches; yellowish brown (10YR 5/8) sandy clay loam; weak fine subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; gradual smooth boundary.

B3—64 to 80 inches; strong brown (7.5YR 5/8) sandy clay loam with pockets of sand and clay; few fine faint yellowish brown mottles; weak medium subangular blocky structure; very friable; few nodules of plinthite in the lower part of the layer; very strongly acid.

Solum thickness ranges from 80 to 120 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 40 to 72 inches thick. The A1 horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. The Ap horizon and the A2 horizon have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4, 6, or 8.

The B1 horizon, if present, has hue of 5YR, 7.5YR, or 10YR; value of 5 or 6; and chroma of 6 or 8. The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 6 or 8; or it has hue of 5YR, value of 5, and chroma of 6 or 8; or it has hue of 5YR, value of 4, and chroma of 6; or it has hue of 2.5YR, value of 4 or 5, and chroma of 6 or 8. It is sandy loam or sandy clay loam.

Vance series

The Vance series consists of well drained, slowly permeable soils formed in material weathered mainly from granite. These soils are on uplands of the Southern Piedmont. Slope is 2 to 15 percent.

Vance soils are associated with Cecil, Pacolet, and Wedowee soils on the uplands. The associated soils have a subsoil that is less plastic than Vance soils. Cecil soils commonly are on somewhat higher lying ridgetops and have a subsoil that is redder. Pacolet and Wedowee soils commonly are on more narrow ridgetops and steeper hillsides.

Typical pedon of Vance sandy clay loam, 6 to 10 percent slopes, eroded, in a wooded area, 0.3 mile south on Fortson Road from the intersection of Woolridge Road, and 300 feet east:

Ap—0 to 4 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; medium acid; abrupt smooth boundary.

B21t—4 to 16 inches; yellowish red (5YR 5/6) clay; few medium distinct red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; very firm, plastic if wet; continuous clay films on faces of peds; strongly acid; gradual wavy boundary.

B22—16 to 26 inches; yellowish red (5YR 5/8) clay; common medium distinct red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; very firm, plastic if wet; continuous clay films on faces of peds; strongly acid; gradual wavy boundary.

B23t—26 to 36 inches; mottled red (2.5YR 5/8), yellowish red (5YR 5/6), and strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

C—36 to 60 inches; mottled red (2.5YR 5/6), yellowish red (5YR 5/6), strong brown (7.5YR 5/6), and light gray (10YR 7/2) saprolite that crushes to sandy loam; massive; friable; strongly acid.

Solum thickness ranges from 24 to 40 inches. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 4 to 8 inches thick. It has hue of 10YR, value of 5, and chroma of 2 to 4 or 6; or hue of 10YR, value of 4, and chroma of 2. The A horizon ranges from sandy loam to sandy clay loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8; or it has hue of 5YR, value of 4, and chroma of 6 or 8; or it has hue of 5YR, value of 5, and chroma of 6. Few or common reddish and brownish mottles are throughout.

The C horizon is mottled in hue of 2.5YR or 7.5YR, value of 5 to 7, and chroma of 4 or 6; or it has hue of 5YR or 10YR, value of 5 to 7, and chroma of 3, 4, or 6. This horizon is saprolite that crushes to clay loam, loam, sandy clay loam, or sandy loam.

Vaucluse series

The Vaucluse series consists of well drained, slowly permeable soils that formed in sandy and loamy marine sediment. These soils are on uplands of the Sand Hills. Slope is 5 to 15 percent.

Vaucluse soils are associated with Ailey, Lakeland, Troup, and Wagram soils on the uplands. Ailey soils a e arenic. Lakeland soils are sandy throughout. Troup anu Wagram soils do not have a cemented layer in the subsoil. Troup soils are grossarenic, and Wagram soils are arenic.

Typical pedon of Vaucluse sandy loam, 8 to 15 percent slopes, in a wooded area, north from Macon Road to the end of Layfield Road, 0.5 mile west and southwest on a woods road, and 200 feet east of the woods road:

Ap—0 to 6 inches; grayish brown (10YR 5/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; few brown nodules of ironstone; strongly acid; clear wavy boundary.

B21t—6 to 14 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm; few fine distinct red mottles; common fine and medium roots; continuous clay films on faces of peds; strongly acid; clear wavy boundary.

B22t—14 to 26 inches; mottled yellowish red (5YR 5/6), red (2.5YR 4/6), and strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; firm; continuous clay films on horizontal faces of peds; very strongly acid; clear wavy boundary.

B23t—26 to 44 inches; mottled red (2.5YR 4/6), yellowish red (5YR 5/6), strong brown (7.5YR 5/8), and light gray (10YR 7/2) sandy clay loam; moderate coarse subangular blocky structure parting to angular blocky; firm and brittle; continuous clay films on faces of peds; very strongly acid; gradual wavy boundary.

B24t—44 to 54 inches; mottled strong brown (7.5YR 5/6), light gray (10YR 7/2), and red (2.5YR 4/6) sandy clay loam; moderate coarse subangular blocky structure; very firm, brittle and compact; very strongly acid; gradual wavy boundary.

B3—54 to 62 inches; mottled light gray (10YR 7/1) and strong brown (7.5YR 5/8) sandy loam that has pockets of clay; weak medium subangular blocky structure; friable; very strongly acid.

Solum thickness ranges from 40 to 60 inches or more. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Nodules of ironstone are few or common in the A horizon and, if present, are few or common in the B horizon. Depth to the horizon that is brittle ranges from 15 to 30 inches. Pebbles commonly are on the surface and throughout the soil. Coarse sand grains are common throughout the Bt horizon.

The A horizon is 4 to 8 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The B21t horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8; or it has hue of 7.5YR or 10YR, value of 5, and chroma of 6 or 8. The B22t horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8; or it has hue of 7.5YR or 10YR, value of 5, and chroma of 6 or 8. The B23t, B24t, and B3 horizons have colors similar to those of the B22t horizon, or they are mottled and have those colors.

Wagram series

The Wagram series consists of well drained soils that formed in sandy and loamy marine sediment. Permeability is moderately rapid. These soils are on uplands of the Southern Coastal Plain. Slope is 2 to 8 percent.

Wagram soils are associated with Ailey, Dothan, Orangeburg, and Troup soils on the uplands. Ailey soils have a firm, brittle layer in the subsoil. Dothan and Orangeburg soils have an A horizon less than 20 inches thick. Dothan soils have more than 5 percent plinthite in some horizon above a depth of 60 inches. Troup soils are grossarenic.

Typical pedon of Wagram loamy sand, 2 to 5 percent slopes, in a wooded area, 0.5 mile north of the intersection of the Fort Benning Military Reservation boundary and Cartlege Road, and 100 feet east of the road:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loamy sand; single grained; loose; many fine roots; slightly acid; clear wavy boundary.

A21—7 to 25 inches; pale brown (10YR 6/3) loamy sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

A22—25 to 36 inches; pale yellow (2.5Y 7/4) loamy sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

B1—36 to 40 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; very friable; few fine roots; strongly acid; gradual wavy boundary.

B21t—40 to 48 inches; yellowish brown (10YR 5/6) sandy clay loam; few fine distinct strong brown mottles; moderate medium subangular blocky structure; friable; 3 percent plinthite; thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

B22t—48 to 64 inches; yellowish brown (10YR 5/6) sandy clay loam; few fine faint pale brown mottles and few fine distinct strong brown mottles; moderate medium subangular blocky structure; friable; 2 percent plinthite; strongly acid; gradual wavy boundary.

B3—64 to 72 inches; mottled yellowish brown (10YR 5/8), strong brown (7.5YR 5/8), and light gray (10YR 7/2) sandy loam; weak fine granular structure; very friable; few plinthite nodules; very strongly acid.

Solum thickness ranges from 60 to 80 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas. If present, plinthite ranges up to 5 percent.

The A horizon is 20 to 40 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2; or it has hue of 2.5Y, value of 4 or 5, and chroma of 2. The A2 horizon has hue of 10YR, value of 6 or 7, and chroma of 3 or 4; or it has hue of 2.5Y, value of 6 or 7, and chroma of 4.

The B1 horizon has hue of 10YR, value of 5, and chroma of 6 or 8; or hue of 10YR, value of 4, and chroma of 4. The Bt horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8. If present, mottles are red, brown, and yellow in the lower part of the Bt horizon. In some pedons, gray mottles are at a depth of 60 inches or more. The Bt horizon is sandy clay loam or sandy loam.

Wahee series

The Wahee series consists of somewhat poorly drained, slowly permeable soils that formed in clayey sediment. These soils are on terraces near the larger streams of the Southern Coastal Plain. The water table is at a depth of 0.5 foot to 1.5 feet from early in winter to early in spring. Slope is 0 to 2 percent.

Wahee soils are associated with Troup and Wagram soils. The associated soils are well drained and are on uplands of the Southern Coastal Plain. Troup soils are grossarenic, and Wagram soils are arenic.

Typical pedon of Wahee fine sandy loam, 0 to 2 percent slopes, in a wooded area, 0.6 mile west on the 2nd Armored Division Road from Wolfcreek crossing, and 100 feet south:

A1—0 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; strongly acid; clear wavy boundary.

A2—7 to 12 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; very strongly acid; clear wavy boundary.

B21t—12 to 24 inches; yellowish brown (10YR 5/8) clay; few fine faint mottles; moderate medium subangular blocky structure; firm; common medium roots; thick clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22tg—24 to 42 inches; light brownish gray (10YR 6/2) clay; common coarse distinct strong brown (7.5YR 5/8) and red (2.5YR 5/8) mottles; strong medium subangular blocky structure; very firm, plastic if wet; few medium roots; continuous clay films on faces of peds; very strongly acid; gradual wavy boundary.

B3g—42 to 60 inches; light gray (10YR 6/1) sandy clay loam with pockets of clay and sand; many coarse distinct yellowish brown (10YR 5/8) and brownish

yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky if wet; few medium roots; few fine pores; few discontinuous clay films in old root holes; very strongly acid.

Solum thickness ranges from 40 to 60 inches or more. The soil is very strongly acid or strongly acid throughout except for the surface layer in limed areas.

The A horizon is 3 to 14 inches thick. The A1 horizon or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3.

The B1 horizon, if present, has hue of 10YR, value of 5 to 6, and chroma of 3, 4, 6, or 8. The B21t horizon contains common or many yellow, brown, red, and gray mottles. Below this, the Bt horizon has hue of 10YR, value of 6, and chroma of 2 or less. The B3 horizon, if present, is mottled gray, brown, yellow, and red; or it has a matrix hue of 10YR, value of 6 or 7, and chroma of 1; or hue of 2.5Y, value of 6 or 7, and chroma of 2 and mottles that are yellow, brown, and yellowish red. The B3 horizon is sandy clay, sandy clay loam, or clay loam.

Wedowee series

The Wedowee series consists of well drained, moderately permeable soils that formed in material weathered mainly from gneiss and granite. These soils are on uplands of the Southern Piedmont. Slope is 6 to 35 percent.

Wedowee soils are associated with Cecil and Pacolet soils on the uplands. Cecil soils have a thicker solum and a redder subsoil. Pacolet soils have a redder subsoil.

Typical pedon of Wedowee sandy loam, 10 to 35 percent slopes, in a wooded area, 0.8 mile south of the Harris County line on Old River Road, 50 feet east of the road:

A1—0 to 5 inches; grayish brown (10YR 5/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; common coarse and medium pebbles; strongly acid; clear smooth boundary.

A2—5 to 10 inches; yellow (10YR 7/6) sandy loam; weak fine granular structure; very friable; common fine and medium pebbles; few fine roots; strongly acid; gradual wavy boundary.

B1—10 to 16 inches; reddish yellow (5YR 6/8) sandy clay loam; weak fine subangular blocky structure; friable; discontinuous clay films on faces of peds; few fine roots; common fine and medium pebbles; strongly acid; clear smooth boundary.

B2t—16 to 30 inches; yellowish red (5YR 5/6) sandy clay; few medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; discontinuous clay films on faces of peds; common fine and medium pebbles; strongly acid; gradual smooth boundary.

B3—30 to 36 inches; reddish yellow (5YR 6/8) and yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; common fine and medium pebbles; very strongly acid; gradual smooth boundary.

C1—36 to 44 inches; mottled strong brown (7.5YR 5/6), yellowish brown (10YR 5/8), and red (2.5YR 4/8) sandy loam; massive; friable; very strongly acid; gradual wavy boundary.

C2—44 to 60 inches; mottled strong brown (7.5YR 5/6), yellowish brown (10YR 5/8), yellowish red (5YR 5/6), and very pale brown (10YR 7/3) saprolite that crushes to sandy loam; rock-controlled structure; friable; strongly acid.

Solum thickness ranges from 20 to 40 inches. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 3 to 13 inches thick. The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The Ap horizon and A2 horizon have hue of 10YR, value of 4 to 7, and chroma of 4 or 6.

The Bt horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 6 or 8. Brown and red mottles are common in this horizon. The Bt horizon is clay loam, sandy clay, or clay.

The C horizon is mottled red, brown, or yellow. It is sandy loam or sandy clay loam.

Wickham series

The Wickham series consists of well drained, moderately permeable soils on stream terraces. These soils formed in loamy sediment from the Southern Piedmont. Slope is 0 to 2 percent.

Wickham soils are associated with Chewacla and Dogue soils. Somewhat poorly drained Chewacla soils are on flood plains. Moderately well drained Dogue soils are on stream terraces of the Southern Coastal Plain.

Typical pedon of Wickham fine sandy loam, 0 to 2 percent slopes, 1.3 miles south of Tenth Avenue on Victory Drive (U.S. Highway 280), 400 feet west of Victory Drive:

Ap—0 to 8 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; few medium rounded quartz pebbles; medium acid; clear smooth boundary.

B1—8 to 13 inches; strong brown (7.5YR 5/6) sandy loam; weak fine subangular blocky structure; friable; few rounded quartz pebbles; many fine and medium roots; common fine pores; patchy clay films on faces of peds; strongly acid; clear smooth boundary.

B2t—13 to 38 inches; yellowish red (5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few medium rounded quartz

pebbles; common fine roots; patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

B3—38 to 54 inches; strong brown (7.5YR 5/6) sandy loam; weak fine subangular blocky structure; friable; few fine roots; patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

C—54 to 60 inches; yellowish red (5YR 5/8) sandy loam; massive; friable; common flakes of fine mica and water-rounded gravel; strongly acid.

Solum thickness ranges from 40 to 60 inches. The soil is medium acid to very strongly acid throughout except for the surface layer in limed areas.

The A horizon is 5 to 10 inches thick. It has hue of 7.5YR, value of 4 or 5, and chroma of 4; or it has hue of 10YR, value of 4, and chroma of 3 or 4; or it has hue of 10YR, value of 5, and chroma of 3.

The B1 horizon has hue of 7.5YR, value of 5, and chroma of 6 or 8; or it has hue of 5YR, value of 4, and chroma of 8. The B1 horizon is sandy loam or sandy clay loam. The Bt horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 4, 6, or 8. The Bt horizon is sandy clay loam or clay loam. The B3 horizon has hue of 5YR, value of 4 or 5, and chroma of 8; or it has hue of 7.5YR, value of 5, and chroma of 6.

The C horizon has hue of 5YR, value of 5, and chroma of 6 or 8.

formation of the soils

Soil characteristics are determined by the physical and mineral composition of the parent material; the climate under which the parent material accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the soil material *(4)*. All of these factors influence every soil, but the significance of each factor varies from place to place. In one area, one factor may dominate soil formation; in another area, a different factor may be the most important.

The interrelationships among these five factors are complex, and the effects of any one factor cannot be isolated and completely evaluated. It is convenient, however, to discuss each factor separately and to indicate the probable effects of each.

parent material

Parent material is the unconsolidated mass in which soil forms. It is largely responsible for the chemical and mineralogical composition of the soil. According to the 1976 Geologic Map of Georgia *(5)*, about 25 percent of Muscogee County, the Piedmont area, is underlain by crystalline rock. The rest is underlain by sedimentary deposits of the Coastal Plain.

The Piedmont area is underlain by biotite gneiss, granite gneiss, and metamorphosed mafic rocks. The parent material of Cecil, Hiwassee, Pacolet, Vance, and Wedowee soils weathered from these rocks. These soils are low in base saturation and have mainly kaolinitic mineralogy.

The Coastal Plain area is underlain by sedimentary deposits classified as the Tuscaloosa Formation and the Eutaw Formation of the Mesozoic Era. Excessively drained Lakeland soils and well drained Ailey, Fuquay, Troup, Vaucluse, and Wagram soils, and moderately well drained Stilson soils, on uplands, formed mainly in thick, sandy deposits of these formations. The Ailey and Vaucluse soils, however, have a subsoil that is loamy and weakly cemented, firm, and brittle. All are low in base saturation and have mainly siliceous mineralogy. Well drained Dothan, Esto, and Orangeburg soils, moderately well drained Pelion soils, and somewhat poorly drained Susquehanna soils, on uplands, formed mainly in loamy or clayey deposits of these formations. These soils are mainly low in base saturation and have dominantly siliceous mineralogy.

The well drained Masada and Wickham soils, the moderatly well drained Dogue and Eunola soils, and the somewhat poorly drained Wahee soils formed in undifferentiated terrace deposits. The well drained Toccoa soils, the well drained and moderately well drained Congaree soils, the somewhat poorly drained Chewacla soils, the poorly drained Bibb and Chastain soils, and Hydraquents formed mainly in stream alluvium. All are low in base saturation and have dominantly mixed or siliceous mineralogy.

climate

The two most important measurable features of climate that affect soil properties are rainfall and temperature. Water is essential in the formation of a soil. Water dissolves soluble materials and is used by plants and animals. It transports material from one part of the soil to another and from one area to another. These processes and chemical reactions depend to some extent on temperature. Temperature affects the type and quantity of vegetation, the amount and kind of organic matter, and the rate of decomposition of organic matter.

The climate of Muscogee County is warm and moist, probably similar to the climate that existed when the soils were forming. Soils in Muscogee County formed under a thermic temperature regime. The average annual air temperature is about 64 degrees F. The soil temperature at a depth of 20 inches is commonly about 2 degrees higher. The high rainfall and warm temperature contribute to rapid soil formation. Rainfall and temperature are uniform throughout the survey area.

plants and animals

The role of plants and animals is significant in soil development, but the direct impact is difficult to measure. Some of the changes caused by plants and animals are gains in organic matter and nitrogen, gains or losses of plant nutrients, and changes in soil structure and porosity.

Plants provide cover that reduces erosion. They stabilize the surface of the soil, enabling the soil-forming processes to continue. Plants also provide a more stable environment for the soil-forming processes because they reduce the extremes in temperature that unprotected soils are subject to. The soils of Muscogee County formed under a succession of plant types. Deciduous

forest, the climax vegetation, has contributed significantly to the recycling of plant nutrients, and the accumulation of organic matter and has provided energy for animal life.

Animal life in the soils is abundant under the present vegetation and environment. Ants, bees, wasps, earthworms, and spiders make channels in the soil, and rodents, moles, crustaceans, reptiles, and foxes make burrows, thus mixing the upper horizons of the soil. Bacteria, fungi, and other microorganisms hasten decomposition of organic matter and increase the release of minerals for additional plant growth. Man affects the soil-forming process by tilling the soils, smoothing hills, filling valleys, and reducing or increasing fertility.

The net gains and losses caused by plants and animals in the soil-forming process are important in Muscogee County. Within the relatively small confines of the survey area, however, one soil does not significantly differ from another soil because of the effect of plants and animals.

relief

Relief is the elevations or inequalities of a land surface considered collectively. Color of the soil, thickness of the solum, wetness, soil temperature, erosion, thickness and content of organic matter of the A horizon, and plant cover are commonly influenced by relief.

In Muscogee County, thickness of the solum and wetness of the upland soils are obviously related to relief. Cecil soils, which commonly are on very gently sloping ridgetops or gently sloping hillsides, have a thicker solum than Pacolet soils, which are on the steeper hillsides. The differences in solum thickness can be attributed to the slow geologic erosion on very gently sloping and gently sloping soils and to the rapid geologic erosion on steep soils.

Because the movement of water across the surface and through the soil profile is controlled largely by relief, the degree of soil wetness is related to relief. On the higher, sloping areas, where runoff is more rapid and less water enters the soil, the soils are drier. As a result of runoff and the lateral movement of water through the soil, lower lying soils commonly are wetter. The well drained Orangeburg soils on uplands characteristically are red and have few, if any, mottles. The poorly drained Bibb soils on flood plains have a seasonally high water table and are characteristically gray throughout.

time

The length of time that the soil-forming factors act on the parent material largely determines the characteristics of the soil. Soils in Muscogee County are generally classified as either young or mature. Young soils do not have pedogenic horizons; they show an irregular decrease in content of organic carbon with increasing depth. Mature soils are in equilibrium with the environment. They have readily recognizable pedogenic horizons; they show a regular decrease in content of organic carbon with increasing depth.

Bibb soils are on flood plains that annually receive new sediment from floodwaters. They are stratified. They are not old enough to have a zone of illuviation. Cecil, Dothan, and Orangeburg soils commonly are on stable upland landscapes where the soil-forming processes have been active for thousands of years. These soils have a thick solum and a highly developed zone of illuviation.

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glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	More than 12

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of

regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated

by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size

measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of

sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to insure satisfactory performance of the soil for a specific use.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-77 at Columbus, Georgia]

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days[1]	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	57.3	35.5	46.4	76	11	107	4.31	2.29	5.96	8	.1
February---	61.1	37.4	49.2	80	17	108	4.54	2.53	6.17	7	.5
March------	67.9	43.9	55.9	85	25	226	5.95	3.29	8.11	8	.0
April------	77.4	51.8	64.6	90	33	438	4.26	1.83	6.22	6	.0
May--------	83.9	60.0	72.0	95	42	682	4.27	1.84	6.24	6	.0
June-------	89.4	67.4	78.4	99	53	852	4.39	2.51	5.92	7	.0
July-------	90.9	70.7	80.8	99	62	955	5.65	3.23	7.62	10	.0
August-----	90.7	70.3	80.5	98	61	946	4.06	2.09	5.67	7	.0
September--	85.9	65.6	75.7	97	49	771	3.67	1.81	5.18	6	.0
October----	76.9	53.1	65.0	91	32	465	2.17	.36	3.56	3	.0
November---	66.8	42.2	54.5	83	24	169	3.06	1.37	4.43	5	.0
December---	59.5	37.1	48.3	78	17	103	5.02	2.58	7.00	8	.0
Yearly:											
Average--	75.6	52.9	64.3	---	---	---	---	---	---	---	---
Extreme--	---	---	---	101	10	---	---	---	---	---	---
Total----	---	---	---	---	---	5,822	51.35	42.51	59.77	81	.6

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-77 at Columbus, Georgia]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 11	March 24	April 8
2 years in 10 later than--	March 3	March 17	April 2
5 years in 10 later than--	February 16	March 4	March 21
First freezing temperature in fall:			
1 year in 10 earlier than--	November 15	November 1	October 27
2 years in 10 earlier than--	November 24	November 8	October 31
5 years in 10 earlier than--	December 10	November 22	November 7

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-77 at Columbus, Georgia]

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	265	234	208
8 years in 10	276	244	216
5 years in 10	296	262	230
2 years in 10	316	281	245
1 year in 10	327	291	253

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AaB	Ailey loamy coarse sand, 2 to 5 percent slopes	2,700	1.9
AaC	Ailey loamy coarse sand, 5 to 8 percent slopes	5,350	3.8
Bh	Bibb sandy loam	5,150	3.7
CeB	Cecil sandy loam, 2 to 6 percent slopes	1,900	1.3
CfC2	Cecil sandy clay loam, 6 to 10 percent slopes, eroded	2,800	2.0
Ch	Chastain loam	200	0.1
Ck	Chewacla loam	4,631	3.3
Cn	Congaree loam	265	0.2
DgA	Dogue loam, 1 to 2 percent slopes	600	0.4
DoB	Dothan loamy sand, 2 to 5 percent slopes	4,150	2.9
DoC	Dothan loamy sand, 5 to 8 percent slopes	2,000	1.4
DuB	Dothan-Urban land complex, 2 to 5 percent slopes	13,600	9.7
EmB	Esto sandy loam, 2 to 5 percent slopes	1,200	0.9
EnE	Esto-Urban land complex, 8 to 25 percent slopes	1,300	0.9
EOD	Esto, Fuquay, and Ailey loamy sands, 5 to 12 percent slopes	700	0.5
EPE	Esto and Troup loamy sands, 12 to 25 percent slopes	2,200	1.6
EtA	Eunola sandy loam, 0 to 3 percent slopes	2,200	1.6
EuA	Eunola-Urban land complex, 0 to 3 percent slopes	3,800	2.7
HsB	Hiwassee loam, 2 to 6 percent slopes	400	0.3
Hy	Hydraquents, loamy	200	0.1
LaC	Lakeland sand, 5 to 10 percent slopes	300	0.2
LaE	Lakeland sand, 10 to 25 percent slopes	550	0.4
MaA	Masada fine sandy loam, 0 to 3 percent slopes	200	0.1
MuA	Masada-Urban land complex, 0 to 3 percent slopes	300	0.2
OrB	Orangeburg loamy sand, 2 to 5 percent slopes	1,900	1.3
OrC	Orangeburg loamy sand, 5 to 8 percent slopes	1,800	1.3
OuC	Orangeburg-Urban land complex, 2 to 8 percent slopes	1,800	1.3
PfE	Pacolet sandy loam, 15 to 25 percent slopes	3,400	2.4
PgC2	Pacolet sandy clay loam, 6 to 10 percent slopes, eroded	5,850	4.1
PgD2	Pacolet sandy clay loam, 10 to 15 percent slopes, eroded	8,700	6.2
PhC	Pacolet-Urban land complex, 2 to 10 percent slopes	300	0.2
Pm	Pelham loamy sand	4,000	2.8
Pt	Pits, quarry	80	0.1
Rx	Rock outcrop	80	0.1
SeA	Stilson loamy sand, 0 to 3 percent slopes	1,290	0.9
SuB	Susquehanna sandy loam, 2 to 5 percent slopes	930	0.7
SuC	Susquehanna sandy loam, 5 to 8 percent slopes	900	0.6
To	Toccoa sandy loam	5,000	3.5
TrB	Troup loamy fine sand, 2 to 5 percent slopes	2,150	1.5
TrC	Troup loamy fine sand, 5 to 8 percent slopes	4,350	3.1
TrD	Troup loamy fine sand, 8 to 12 percent slopes	1,350	1.0
TSD	Troup and Esto loamy sands, 5 to 15 percent slopes	1,500	1.1
TVD	Troup, Vaucluse, and Pelion loamy sands, 8 to 15 percent slopes	6,700	4.7
Ua	Udorthents, loamy	600	0.4
Ub	Udorthents, clayey	200	0.1
Ud	Urban land	2,500	1.8
VaB	Vance sandy loam, 2 to 6 percent slopes	1,350	1.0
VbC2	Vance sandy clay loam, 6 to 10 percent slopes, eroded	2,400	1.7
VbD2	Vance sandy clay loam, 10 to 15 percent slopes, eroded	1,200	0.9
VeC	Vaucluse sandy loam, 5 to 8 percent slopes	3,000	2.1
VeD	Vaucluse sandy loam, 8 to 15 percent slopes	4,700	3.3
WaB	Wagram loamy sand, 2 to 5 percent slopes	2,100	1.5
WaC	Wagram loamy sand, 5 to 8 percent slopes	3,100	2.2
WbA	Wahee fine sandy loam, 0 to 2 percent slopes	180	0.1
WeC	Wedowee sandy loam, 6 to 10 percent slopes	3,000	2.1
WeE	Wedowee sandy loam, 10 to 35 percent slopes	7,700	5.5
WhA	Wickham fine sandy loam, 0 to 2 percent slopes	250	0.2
	Total	141,056	100.0

TABLE 5.--IMPORTANT FARMLAND

[Acreage figures as of 1979. Soils not listed do not qualify as prime farmland or additional farmland of statewide importance]

Soil name and map symbol	Prime farmland	Additional farmland of statewide importance
	Acres	Acres
AaB---------- Ailey	---	2,700
CeB---------- Cecil	1,900	---
CfC2---------- Cecil	---	2,800
Ck---------- Chewacla	---	4,631
Cn---------- Congaree	265	---
DgA---------- Dogue	600	---
DoB---------- Dothan	4,150	---
DoC---------- Dothan	2,000	---
EmB---------- Esto	---	1,200
EtA*---------- Eunola	2,200	---
HsB---------- Hiwassee	400	---
MaA---------- Masada	200	---
OrB---------- Orangeburg	1,900	---
OrC---------- Orangeburg	1,800	---
SeA---------- Stilson	1,290	---
To*---------- Toccoa	5,000	---
TrB---------- Troup	---	2,150
VaB---------- Vance	1,350	---
VbC2---------- Vance	---	2,400
VeC---------- Vaucluse	---	3,000
WaB---------- Wagram	---	2,100

See footnote at end of table.

TABLE 5.--IMPORTANT FARMLAND--Continued

Soil name and map symbol	Prime farmland	Other farmland of statewide importance
	Acres	Acres
WaC----------		
Wagram	---	3,100
WbA----------		
Wahee	---	180
WeC----------		
Wedowee	---	3,000
WhA----------		
Wickham	250	---
Total----------	23,305	27,261

* These soils are mainly on the Fort Benning Military Reservation and are not available for agricultural use.

TABLE 6.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn	Soybeans	Pasture	Grass-legume hay	Improved bermuda-grass	Tall fescue	Bahiagrass
	Bu	Bu	AUM*	Ton	AUM*	AUM*	AUM*
AaB---- Ailey	50	20	5.5	3.0	6.0	---	6.0
AaC---- Ailey	45	18	4.5	2.5	5.0	---	5.0
Bh---- Bibb	---	---	---	---	---	8.0	---
CeB---- Cecil	95	46	6.5	4.5	9.0	7.5	7.5
CfC2---- Cecil	60	30	5.0	3.5	6.0	5.5	6.0
Ch---- Chastain	50	25	---	---	---	8.0	---
Ck---- Chewacla	100	35	11.0	4.0	9.0	8.0	8.0
Cn---- Congaree	140	40	10.0	4.5	10.0	9.0	9.0
DgA---- Dogue	125	45	10.0	3.5	10.5	9.5	8.0
DoB---- Dothan	120	35	8.0	4.5	10.0	8.5	9.0
DoC---- Dothan	100	30	7.0	4.0	9.5	8.0	8.0
DuB---- Dothan-Urban land	---	---	---	---	---	---	---
EmB---- Esto	50	35	5.5	3.0	6.0	5.0	6.0
EnE---- Esto-Urban land	---	---	---	---	---	---	---
EOD---- Esto, Fuquay, and Ailey	---	---	---	---	---	---	---
EPE---- Esto and Troup	---	---	---	---	---	---	---
EtA---- Eunola	100	35	8.0	4.5	10.0	9.0	9.0
EuA---- Eunola-Urban land	---	---	---	---	---	---	---
HsB---- Hiwassee	95	45	6.5	3.9	10.0	8.5	8.5
Hy**. Hydraquents							
LaC---- Lakeland	---	---	6.0	3.5	6.5	---	6.5

See footnotes at end of table.

TABLE 6.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Pasture	Grass-legume hay	Improved bermuda-grass	Tall fescue	Bahiagrass
	Bu	Bu	AUM*	Ton	AUM*	AUM*	AUM*
LaE---- Lakeland	---	---	5.5	3.0	6.0	---	6.0
MaA---- Masada	120	45	8.5	4.0	10.0	9.0	9.0
MuA---- Masada-Urban land	---	---	---	---	---	---	---
OrB---- Orangeburg	120	45	8.0	4.5	10.5	8.5	8.5
OrC---- Orangeburg	95	35	7.5	4.0	10.0	8.0	8.0
OuC---- Orangeburg-Urban land	---	---	---	---	---	---	---
PfE---- Pacolet	---	---	---	---	---	---	---
PgC2---- Pacolet	50	20	4.0	2.5	5.5	5.0	5.0
PgD2---- Pacolet	---	---	3.5	2.0	5.0	4.5	4.5
PhC---- Pacolet-Urban land	---	---	---	---	---	---	---
Pm---- Pelham	---	---	---	---	---	---	---
Pt**. Pits							
Rx**. Rock outcrop							
SeA---- Stilson	80	35	7.0	4.0	10.0	9.0	7.5
SuB---- Susquehanna	---	---	6.0	3.0	---	7.5	6.5
SuC---- Susquehanna	---	---	5.5	2.5	---	6.5	5.5
To---- Toccoa	90	35	9.0	4.0	9.0	8.0	8.0
TrB---- Troup	60	25	6.5	3.5	7.5	---	7.2
TrC---- Troup	55	22	6.0	3.0	7.3	---	7.0
TrD---- Troup	---	---	4.0	2.5	6.5	---	5.0
TSD---- Troup and Esto	---	---	---	---	---	---	---
TVD---- Troup, Vaucluse, and Pelion	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 6.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Pasture	Grass-legume hay	Improved bermuda-grass	Tall fescue	Bahiagrass
	Bu	Bu	AUM*	Ton	AUM*	AUM*	AUM*
Ua**, Ub**. Udorthents							
Ud**. Urban land							
VaB---------- Vance	80	35	6.0	4.8	7.0	6.5	6.0
VbC2---------- Vance	75	30	5.0	4.8	6.0	5.0	4.5
VbD2---------- Vance	---	---	4.0	3.0	5.0	4.0	4.0
VeC---------- Vaucluse	60	20	5.0	3.0	7.0	6.0	6.0
VeD---------- Vaucluse	55	15	5.0	3.0	7.0	6.0	6.0
WaB---------- Wagram	75	25	8.5	4.5	8.0	7.0	8.5
WaC---------- Wagram	70	20	7.5	4.0	7.5	6.5	8.0
WbA---------- Wahee	90	40	7.5	4.0	9.0	9.0	8.0
WeC---------- Wedowee	75	25	5.0	3.5	7.0	6.0	6.5
WeE---------- Wedowee	---	---	---	---	---	---	---
WhA---------- Wickham	120	45	9.5	5.5	9.0	8.0	9.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	450	---	---	---	---
II	19,805	8,350	9,355	2,100	---
III	25,335	12,350	4,811	8,174	---
IV	27,995	18,020	200	9,775	---
V	9,150	---	9,150	---	---
VI	32,576	27,740	---	4,836	---
VII	985	105	---	880	---
VIII	200	---	200	---	---

TABLE 8.--LANDSCAPE PLANTS ADAPTED TO WET SOILS AND DRY SOILS

[Soils not listed are adapted to all the plants in the table, except Hydraquents (Hy), which are poorly suited to landscaping]

Soil group and map symbol	Deciduous trees	Deciduous shrubs and vines	Broadleaf evergreen trees, shrubs, and vines	Ground cover	Narrowleaf evergreens
*Soils that have a seasonal high water table in winter and spring: Bh, Ch, Ck, Pm.	American elm, baldcypress, Japanese zelcova, pin oak, red maple, river birch, sweetbay magnolia, sweetgum, sugar hackberry, tuliptree, water oak, weeping willow, willow oak.	Oakleaf hydrangea, Virginia creeper.	American holly, bamboo, Carolina laurelcherry, Carolina yellow jessamine, evergreen, euonymous, gallberry, Japan fatsia, live oak, oleander, osmanthus, pampasgrass, silverberry, southern magnolia, southern waxmyrtle, thorny elaeagnus, waxleaf ligustrum, yaupon holly.	English ivy, liriope, monkey grass, vinca.	Spruce, pine.
Soils that have low available water capacity and are droughty: AaB, AaC, LaC, LaE, TrB, TrC, TrD, TSD, WaB, WaC.	American elm, baldcypress, Chinese chestnut, Chinese elm, Chinese pistache, common persimmon, eastern redbud, flowering crab-apple, goldenraintree, honeylocust, Japanese zelcova, pecan, pin oak, Siberian elm, southern catalpa, water oak, willow oak.	Carolina yellow jessamine, Chinese redbud, crapemyrtle, flowering quince, goldenball, pomegranate, spirea, Virginia creeper, winter creeper, winter jasmine, wisteria.	Barberry, Carolina laurelcherry, common boxwood, elaeagnus, evergreen, euonymous, Frazier's photinia, glossy abelia, Japanese boxwood, ligustrum, live oak, nandina, oleander, pampasgrass, pittosporum, pricklypear, pyracantha, yaupon holly, yucca.	Goldmoss stonecrop, liriope, rosemary, santolina.	Japgarden juniper, podocarpus, shore juniper.

* The soils that have a seasonal high water table are subject to overflow unless protected. The frequency and duration of flooding differs between soils in the group. See description of the map unit for composition and behavior characteristics of map unit.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
AaB, AaC---------- Ailey	4s	Slight	Moderate	Moderate	Slash pine----------	70	Slash pine, longleaf pine.
					Longleaf pine----------	60	
Bh---------- Bibb	2w	Slight	Severe	Severe	Loblolly pine----------	95	Eastern cottonwood, loblolly pine, sweetgum, yellow-poplar.
					Sweetgum----------	90	
					Water oak----------	90	
CeB---------- Cecil	3o	Slight	Slight	Slight	Loblolly pine----------	80	Eastern white pine, loblolly pine, slash pine, yellow-poplar.
					Shortleaf pine----------	69	
					Black oak----------	66	
					Northern red oak--------	82	
					Post oak----------	65	
					Scarlet oak----------	80	
CfC2---------- Cecil	4c	Moderate	Moderate	Moderate	Loblolly pine----------	72	Loblolly pine, slash pine.
					Shortleaf pine----------	66	
Ch---------- Chastain	2w	Slight	Severe	Severe	Sweetgum----------	94	Loblolly pine, American sycamore, sweetgum, cherrybark oak.
					Water oak----------	89	
					Eastern cottonwood-----	90	
					Green ash----------	88	
					Loblolly pine----------	90	
					Water tupelo----------	---	
					White oak----------	---	
					Southern red oak-------	---	
					Baldcypress----------	---	
Ck---------- Chewacla	1w	Slight	Moderate	Moderate	Loblolly pine----------	96	Loblolly pine, slash pine, American sycamore, yellow-poplar, sweetgum, eastern white pine, green ash.
					Yellow-poplar----------	104	
					American sycamore------	90	
					Sweetgum----------	97	
					Water oak----------	86	
					Eastern cottonwood-----	100	
					Green ash----------	97	
					Southern red oak-------	90	
Cn---------- Congaree	1o	Slight	Slight	Slight	Sweetgum----------	100	Loblolly pine, slash pine, yellow-poplar, American sycamore, black walnut, cherrybark oak, eastern cottonwood, sweetgum.
					Yellow-poplar----------	107	
					Cherrybark oak----------	107	
					Loblolly pine----------	90	
					Eastern cottonwood-----	107	
					American sycamore------	89	
					Black walnut----------	100	
					Scarlet oak----------	100	
					Willow oak----------	95	
DgA---------- Dogue	2w	Slight	Moderate	Slight	Loblolly pine----------	90	Loblolly pine.
					Southern red oak-------	80	
					Sweetgum----------	90	
					Yellow-poplar----------	95	
					White oak----------	80	
DoB, DoC---------- Dothan	2o	Slight	Slight	Slight	Slash pine----------	89	Slash pine, loblolly pine, longleaf pine.
					Longleaf pine----------	78	
					Loblolly pine----------	90	
EmB---------- Esto	3o	Slight	Slight	Slight	Loblolly pine----------	82	Loblolly pine, slash pine, longleaf pine.
					Longleaf pine----------	66	
					Slash pine----------	82	
EOD*: Esto----------	3o	Slight	Slight	Slight	Loblolly pine----------	82	Loblolly pine, slash pine, longleaf pine.
					Longleaf pine----------	66	
					Slash pine----------	82	

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
EOD*:							
Fuquay	3s	Slight	Moderate	Moderate	Loblolly pine	83	Slash pine, longleaf pine.
					Slash pine	92	
					Longleaf pine	76	
Ailey	4s	Slight	Moderate	Moderate	Slash pine	70	Slash pine, longleaf pine.
					Longleaf pine	60	
EPE*:							
Esto	3o	Slight	Slight	Slight	Loblolly pine	82	Loblolly pine, slash pine, longleaf pine.
					Longleaf pine	66	
					Slash pine	82	
Troup	3s	Slight	Moderate	Moderate	Loblolly pine	82	Loblolly pine, longleaf pine, slash pine.
					Longleaf pine	75	
					Slash pine	84	
EtA	2w	Slight	Moderate	Slight	Loblolly pine	90	Loblolly pine, slash pine, sweetgum, yellow-poplar.
Eunola					Slash pine	90	
					Sweetgum	90	
HsB	3o	Slight	Slight	Slight	Loblolly pine	82	Loblolly pine, yellow-poplar, slash pine.
Hiwassee					Northern red oak	70	
					Shortleaf pine	76	
					White oak	72	
					Yellow-poplar	85	
LaC, LaE	4s	Slight	Moderate	Moderate	Slash pine	77	Slash pine, loblolly pine.
Lakeland					Loblolly pine	75	
					Longleaf pine	60	
MaA	3o	Slight	Slight	Slight	Southern red oak	70	Loblolly pine, yellow-poplar.
Masada					Shortleaf pine	70	
					Yellow-poplar	100	
					Loblolly pine	82	
OrB, OrC	2o	Slight	Slight	Slight	Loblolly pine	80	Slash pine, loblolly pine.
Orangeburg					Slash pine	86	
					Longleaf pine	77	
PfE	3r	Moderate	Moderate	Slight	Loblolly pine	78	Loblolly pine, shortleaf pine, yellow-poplar.
Pacolet					Shortleaf pine	70	
					Yellow-poplar	90	
PgC2, PgD2	4c	Moderate	Moderate	Moderate	Loblolly pine	70	Loblolly pine, shortleaf pine, yellow-poplar.
Pacolet					Shortleaf pine	60	
					Yellow-poplar	80	
Pm	2w	Slight	Severe	Severe	Slash pine	90	Slash pine, loblolly pine.
Pelham					Loblolly pine	90	
					Longleaf pine	80	
					Sweetgum	80	
					Blackgum	80	
					Water oak	80	
SeA	2w	Slight	Moderate	Slight	Loblolly pine	95	Slash pine, loblolly pine, longleaf pine.
Stilson					Slash pine	95	
					Longleaf pine	80	
					Sweetgum	---	
SuB, SuC	3c	Slight	Moderate	Slight	Loblolly pine	78	Loblolly pine, shortleaf pine.
Susquehanna					Shortleaf pine	70	
To	1o	Slight	Slight	Slight	Loblolly pine	90	Loblolly pine, yellow-poplar, American sycamore, cherrybark oak.
Toccoa					Yellow-poplar	107	
					Sweetgum	100	
					Southern red oak	---	

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
TrB, TrC, TrD---- Troup	3s	Slight	Moderate	Moderate	Loblolly pine----	82	Loblolly pine, longleaf pine, slash pine.
					Longleaf pine----	75	
					Slash pine----	84	
TSD*: Troup----	3s	Slight	Moderate	Moderate	Loblolly pine----	82	Loblolly pine, longleaf pine, slash pine.
					Longleaf pine----	75	
					Slash pine----	84	
Esto----	3o	Slight	Slight	Slight	Loblolly pine----	82	Loblolly pine, slash pine, longleaf pine.
					Longleaf pine----	66	
					Slash pine----	82	
TVD*: Troup----	3s	Slight	Moderate	Moderate	Loblolly pine----	82	Loblolly pine, longleaf pine, slash pine.
					Longleaf pine----	75	
					Slash pine----	84	
Vaucluse----	3o	Slight	Slight	Slight	Loblolly pine----	76	Loblolly pine, slash pine.
					Shortleaf pine----	56	
					Slash pine----	75	
					Longleaf pine----	---	
Pelion----	3w	Slight	Moderate	Slight	Loblolly pine----	80	Loblolly pine, slash pine.
					Slash pine----	80	
VaB, VbC2, VbD2---- Vance	3o	Slight	Slight	Slight	Loblolly pine----	76	Loblolly pine, yellow-poplar.
					Northern red oak----	---	
					Shortleaf pine----	69	
					White oak----	---	
VeC, VeD---- Vaucluse	3o	Slight	Slight	Slight	Loblolly pine----	76	Loblolly pine, slash pine.
					Shortleaf pine----	56	
					Slash pine----	75	
					Longleaf pine----	---	
WaB, WaC---- Wagram	3s	Slight	Moderate	Moderate	Loblolly pine----	82	Loblolly pine, slash pine, longleaf pine.
					Slash pine----	80	
					Longleaf pine----	72	
WbA---- Wahee	2w	Slight	Moderate	Moderate	Loblolly pine----	91	Loblolly pine, slash pine, sweetgum, American sycamore, water oak.
					Slash pine----	86	
					Sweetgum----	90	
WeC---- Wedowee	3o	Slight	Slight	Slight	Loblolly pine----	80	Loblolly pine, shortleaf pine, yellow-poplar.
					Shortleaf pine----	69	
					Southern red oak----	70	
					Northern red oak----	68	
					White oak----	65	
WeE---- Wedowee	3r	Moderate	Moderate	Slight	Loblolly pine----	80	Loblolly pine, shortleaf pine, yellow-poplar.
					Shortleaf pine----	69	
					Southern red oak----	70	
					Northern red oak----	68	
					White oak----	65	
WhA---- Wickham	2o	Slight	Slight	Slight	Loblolly pine----	90	Loblolly pine, slash pine, yellow-poplar.
					Slash pine----	90	
					Yellow-poplar----	100	
					Southern red oak----	---	

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AaB Ailey	Moderate: percs slowly, too sandy.	Moderate: percs slowly, too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
AaC Ailey	Moderate: percs slowly, too sandy.	Moderate: percs slowly, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty.
Bh Bibb	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
CeB Cecil	Slight	Slight	Moderate: slope.	Slight	Slight.
CfC2 Cecil	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Ch Chastain	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ck Chewacla	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Cn Congaree	Slight	Slight	Slight	Slight	Slight.
DgA Dogue	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
DoB Dothan	Slight	Slight	Moderate: slope.	Slight	Slight.
DoC Dothan	Slight	Slight	Severe: slope.	Slight	Slight.
DuB*: Dothan	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.					
EmB Esto	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
EnE*: Esto	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
Urban land.					
EOD*: Esto	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
Fuquay	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
EOD*:					
Ailey	Moderate: slope, percs slowly, too sandy.	Moderate: slope, percs slowly, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
EPE*:					
Esto	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
Troup	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, too sandy.	Severe: slope.
EtA	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Eunola					
EuA*:					
Eunola	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
HsB	Slight	Slight	Moderate: slope.	Slight	Slight.
Hiwassee					
Hy*.					
Hydraquents					
LaC	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
Lakeland					
LaE	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: slope.
Lakeland					
MaA	Slight	Slight	Slight	Slight	Slight.
Masada					
MuA*:					
Masada	Slight	Slight	Slight	Slight	Slight.
Urban land.					
OrB	Slight	Slight	Moderate: slope.	Slight	Slight.
Orangeburg					
OrC	Slight	Slight	Severe: slope.	Slight	Slight.
Orangeburg					
OuC*:					
Orangeburg	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.					
PfE	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Pacolet					
PgC2, PgD2	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Pacolet					
PhC*:					
Pacolet	Slight	Slight	Severe: slope.	Slight	Slight.
Urban land.					

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Pm---------- Pelham	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pt*. Pits					
Rx*. Rock outcrop					
SeA---------- Stilson	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: droughty.
SuB---------- Susquehanna	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight----------	Slight.
SuC---------- Susquehanna	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight----------	Slight.
To---------- Toccoa	Severe: flooding.	Slight----------	Moderate: floods.	Slight----------	Moderate: floods.
TrB---------- Troup	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty, too sandy.
TrC---------- Troup	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, too sandy.
TrD---------- Troup	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope, too sandy.
TSD*: Troup----------	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope, too sandy.
Esto----------	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
TVD*: Troup----------	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope, too sandy.
Vaucluse----------	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: droughty, slope.
Pelion----------	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness.	Moderate: wetness, droughty, slope.
Ua*, Ub*. Udorthents					
Ud*. Urban land					
VaB---------- Vance	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
VbC2---------- Vance	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
VbD2---------- Vance	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
VeC---------- Vaucluse	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----------	Moderate: droughty.
VeD---------- Vaucluse	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: droughty, slope.
WaB---------- Wagram	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
WaC---------- Wagram	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty.
WbA---------- Wahee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
WeC---------- Wedowee	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
WeE---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
WhA---------- Wickham	Slight----------	Slight----------	Slight----------	Slight----------	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AaB---------- Ailey	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
AaC---------- Ailey	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
Bh---------- Bibb	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
CeB---------- Cecil	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CfC2---------- Cecil	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Ch---------- Chastain	Poor	Poor	Fair	Fair	Poor	Good	Good	Poor	Fair	Good.
Ck---------- Chewacla	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Cn---------- Congaree	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
DgA---------- Dogue	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
DoB, DoC---------- Dothan	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DuB*: Dothan----------	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
EmB---------- Esto	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EnE*: Esto----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
EOD*: Esto----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Fuquay----------	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
Ailey----------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
EPE*: Esto----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Troup----------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
EtA---------- Eunola	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EuA*: Eunola----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
HsB---------- Hiwassee	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Hy*. Hydraquents										
LaC, LaE---------- Lakeland	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
MaA---------- Masada	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MuA*: Masada----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
OrB---------- Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OrC---------- Orangeburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
OuC*: Orangeburg--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
PfE---------- Pacolet	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
PgC2---------- Pacolet	Poor	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
PgD2---------- Pacolet	Very poor.	Poor	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
PhC*: Pacolet----------	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Urban land.										
Pm---------- Pelham	Poor	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
Pt*. Pits										
Rx*. Rock outcrop										
SeA---------- Stilson	Fair	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Poor.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
SuB, SuC---------- Susquehanna	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
To---------- Toccoa	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TrB, TrC, TrD------ Troup	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
TSD*:										
Troup----------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Esto----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TVD*:										
Troup----------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Vaucluse----------	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Pelion----------	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Ua*, Ub*. Udorthents										
Ud*. Urban land										
VaB---------- Vance	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
VbC2---------- Vance	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
VbD2---------- Vance	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
VeC---------- Vaucluse	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
VeD---------- Vaucluse	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
WaB---------- Wagram	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WaC---------- Wagram	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WbA---------- Wahee	Fair	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
WeC---------- Wedowee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WeE---------- Wedowee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
WhA---------- Wickham	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AaB---- Ailey	Moderate: cutbanks cave.	Slight----	Slight----	Slight----	Slight----	Moderate: droughty.
AaC---- Ailey	Moderate: cutbanks cave.	Slight----	Slight----	Moderate: slope.	Slight----	Moderate: droughty.
Bh---- Bibb	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
CeB---- Cecil	Moderate: too clayey.	Slight----	Slight----	Moderate: slope.	Moderate: low strength.	Slight.
CfC2---- Cecil	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, low strength.	Slight.
Ch---- Chastain	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
Ck---- Chewacla	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
Cn---- Congaree	Moderate: wetness.	Slight----	Moderate: wetness.	Slight----	Moderate: low strength.	Slight.
DgA---- Dogue	Moderate: wetness, too clayey.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
DoB---- Dothan	Slight----	Slight----	Moderate: wetness.	Slight----	Slight----	Slight.
DoC---- Dothan	Slight----	Slight----	Moderate: wetness.	Moderate: slope.	Slight----	Slight.
DuB*: Dothan----	Slight----	Slight----	Moderate: wetness.	Slight----	Slight----	Slight.
Urban land.						
EmB---- Esto	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
EnE*: Esto----	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Urban land.						
EOD*: Esto----	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Fuquay----	Moderate: slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EOD*:						
Ailey	Moderate: cutbanks cave, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
EPE*:						
Esto	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Troup	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
EtA	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Moderate: wetness.
Eunola						
EuA*:						
Eunola	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Moderate: wetness.
Urban land.						
HsB	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
Hiwassee						
Hy*.						
Hydraquents						
LaC	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty, too sandy.
Lakeland						
LaE	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lakeland						
MaA	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Masada						
MuA*:						
Masada	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Urban land.						
OrB	Slight	Slight	Slight	Slight	Slight	Slight.
Orangeburg						
OrC	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
Orangeburg						
OuC*:						
Orangeburg	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.						
PfE	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pacolet						
PgC2, PgD2	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
Pacolet						

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
PhC*: Pacolet	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
Urban land.						
Pm--- Pelham	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Pt*. Pits						
Rx*. Rock outcrop						
SeA--- Stilson	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
SuB, SuC--- Susquehanna	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
To--- Toccoa	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
TrB--- Troup	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
TrC--- Troup	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
TrD--- Troup	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
TSD*: Troup---	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Esto---	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
TVD*: Troup---	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Vaucluse---	Moderate: dense layer, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Pelion---	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, droughty, slope.
Ua*, Ub*. Udorthents						
Ud*. Urban land						
VaB--- Vance	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
VbC2, VbD2--- Vance	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
VeC--- Vaucluse	Moderate: dense layer.	Slight---	Slight---	Moderate: slope.	Slight---	Moderate: droughty.
VeD--- Vaucluse	Moderate: dense layer, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
WaB--- Wagram	Slight---	Slight---	Slight---	Slight---	Slight---	Moderate: droughty.
WaC--- Wagram	Slight---	Slight---	Slight---	Moderate: slope.	Slight---	Moderate: droughty.
WbA--- Wahee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
WeC--- Wedowee	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
WeE--- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope. slope.	Severe: slope.
WhA--- Wickham	Slight---	Slight---	Slight---	Slight---	Slight---	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AaB, AaC Ailey	Severe: percs slowly.	Severe: seepage.	Slight	Severe: seepage.	Good.
Bh Bibb	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
CeB Cecil	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
CfC2 Cecil	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
Ch Chastain	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Ck Chewacla	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Cn Congaree	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
DgA Dogue	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
DoB, DoC Dothan	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
DuB*: Dothan	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
Urban land.					
EmB Esto	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
EnE*: Esto	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
Urban land.					
EOD*: Esto	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
EOD*:					
Fuquay	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Ailey	Severe: percs slowly.	Severe: seepage, slope.	Moderate: slope.	Severe: seepage.	Fair: slope.
EPE*:					
Esto	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
Troup	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.
EtA	Severe: wetness.	Severe: seepage, flooding, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness, thin layer.
EuA*:					
Eunola	Severe: wetness.	Severe: seepage, flooding, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness, thin layer.
Urban land.					
HsB	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
Hy*. Hydraquents					
LaC	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
LaE	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
MaA	Moderate: percs slowly.	Moderate: seepage.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
MuA*:					
Masada	Moderate: percs slowly.	Moderate: seepage.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Urban land.					
OrB, OrC	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
OuC*:					
Orangeburg	Slight	Moderate: seepage, slope.	Slight	Slight	Good.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
OuC*: Urban land.					
PfE---- Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
PgC2, PgD2---- Pacolet	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
PhC*: Pacolet----	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----	Fair: too clayey.
Urban land.					
Pm---- Pelham	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness.
Pt*. Pits					
Rx*. Rock outcrop					
SeA---- Stilson	Severe: wetness.	Severe: seepage, wetness.	Moderate: wetness.	Severe: seepage.	Fair: wetness.
SuB, SuC---- Susquehanna	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight----	Poor: too clayey, hard to pack.
To---- Toccoa	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Good.
TrB, TrC---- Troup	Slight----	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Fair: too sandy.
TrD---- Troup	Moderate: slope.	Severe: seepage, slope.	Moderate: slope, too sandy.	Severe: seepage.	Fair: too sandy, slope.
TSD*: Troup----	Moderate: slope.	Severe: seepage, slope.	Moderate: slope, too sandy.	Severe: seepage.	Fair: too sandy, slope.
Esto----	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
TVD*: Troup----	Moderate: slope.	Severe: seepage, slope.	Moderate: slope, too sandy.	Severe: seepage.	Fair: too sandy, slope.
Vaucluse----	Severe: percs slowly.	Severe: slope.	Severe: seepage.	Moderate: slope.	Fair: slope.
Pelion----	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ua*, Ub*. Udorthents					
Ud*. Urban land					
VaB---------- Vance	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
VbC2, VbD2---------- Vance	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
VeC---------- Vaucluse	Severe: percs slowly.	Moderate: slope.	Severe: seepage.	Slight----------	Good.
VeD---------- Vaucluse	Severe: percs slowly.	Severe: slope.	Severe: seepage.	Moderate: slope.	Fair: slope.
WaB, WaC---------- Wagram	Slight----------	Moderate: seepage.	Slight----------	Slight----------	Good.
WbA---------- Wahee	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
WeC---------- Wedowee	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope, thin layer.
WeE---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
WhA---------- Wickham	Slight----------	Moderate: seepage.	Severe: seepage.	Slight----------	Fair: thin layer.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AaB, AaC Ailey	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Bh Bibb	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
CeB, CfC2 Cecil	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Ch Chastain	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ck Chewacla	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Cn Congaree	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
DgA Dogue	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
DoB, DoC Dothan	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, thin layer.
DuB*: Dothan	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, thin layer.
Urban land.				
EmB Esto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
EnE*: Esto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Urban land.				
EOD*: Esto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Fuquay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, slope.
Ailey	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too sandy.
EPE*: Esto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Troup	Fair: slope.	Probable	Improbable: too sandy.	Poor: slope.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
EtA Eunola	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
EuA*: Eunola	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
HsB Hiwassee	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Hy*. Hydraquents				
LaC Lakeland	Good	Probable	Improbable: too sandy.	Poor: too sandy.
LaE Lakeland	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
MaA Masada	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
MuA*: Masada	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Urban land.				
OrB, OrC Orangeburg	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
OuC*: Orangeburg	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Urban land.				
PfE Pacolet	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
PgC2, PgD2 Pacolet	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
PhC*: Pacolet	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Urban land.				
Pm Pelham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Pt*. Pits				
Rx*. Rock outcrop				
SeA Stilson	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
SuB, SuC Susquehanna	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
To---------- Toccoa	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
TrB, TrC---------- Troup	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy.
TrD---------- Troup	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy, slope.
TSD*: Troup----------	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy, slope.
Esto----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
TVD*: Troup----------	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy, slope.
Vaucluse----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, slope.
Pelion----------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, slope.
Ua*, Ub*. Udorthents				
Ud*. Urban land				
VaB---------- Vance	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
VbC2, VbD2---------- Vance	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, thin layer.
VeC---------- Vaucluse	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
VeD---------- Vaucluse	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, slope.
WaB, WaC---------- Wagram	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
WbA---------- Wahee	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
WeC---------- Wedowee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
WeE---------- Wedowee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
WhA---------- Wickham	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AaB, AaC---------- Ailey	Severe: seepage.	Moderate: piping.	Deep to water	Droughty, percs slowly, slope.	Rooting depth, percs slowly.	Droughty, rooting depth.
Bh---------- Bibb	Moderate: seepage.	Severe: piping, wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
CeB---------- Cecil	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope----------	Favorable------	Favorable.
CfC2---------- Cecil	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
Ch---------- Chastain	Slight---------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Ck---------- Chewacla	Moderate: seepage.	Severe: piping, wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
Cn---------- Congaree	Moderate: seepage.	Severe: piping.	Favorable------	Wetness--------	Favorable------	Favorable.
DgA---------- Dogue	Moderate: seepage.	Moderate: wetness, hard to pack.	Favorable------	Wetness--------	Wetness--------	Favorable.
DoB, DoC---------- Dothan	Slight---------	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
DuB*: Dothan---------- Urban land.	Slight---------	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
EmB---------- Esto	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
EnE*: Esto---------- Urban land.	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
EOD*: Esto---------- Fuquay---------- Ailey----------	Slight--------- Slight--------- Severe: seepage.	Severe: hard to pack. Slight--------- Moderate: piping.	Deep to water Deep to water Deep to water	Percs slowly, slope. Droughty, slope. Droughty, percs slowly, slope.	Slope, percs slowly. Slope, too sandy. Slope, rooting depth, percs slowly.	Slope, percs slowly. Slope, droughty. Slope, droughty, rooting deptn.
EPE*: Esto----------	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
EPE*: Troup	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, slope.	Slope, too sandy.	Slope, droughty.
EtA--- Eunola	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness	Favorable.
EuA*: Eunola	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness	Favorable.
Urban land.						
HsB--- Hiwassee	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
Hy*. Hydraquents						
LaC--- Lakeland	Severe: seepage.	Severe: seepage.	Deep to water	Droughty	Too sandy	Droughty.
LaE--- Lakeland	Severe: seepage, slope.	Severe: seepage.	Deep to water	Droughty	Slope, too sandy.	Slope, droughty.
MaA--- Masada	Moderate: seepage.	Severe: hard to pack.	Deep to water	Favorable	Favorable	Favorable.
MuA*: Masada	Moderate: seepage.	Severe: hard to pack.	Deep to water	Favorable	Favorable	Favorable.
Urban land.						
OrB, OrC--- Orangeburg	Moderate: seepage.	Moderate: piping.	Deep to water	Slope	Favorable	Favorable.
OuC*: Orangeburg	Moderate: seepage.	Moderate: piping.	Deep to water	Slope	Favorable	Favorable.
Urban land.						
PfE, PgC2, PgD2--- Pacolet	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
PhC*: Pacolet	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
Urban land.						
Pm--- Pelham	Severe: seepage.	Severe: piping, wetness.	Flooding	Wetness, droughty, flooding.	Wetness	Wetness, droughty.
Pt*. Pits						
Rx*. Rock outcrop						
SeA--- Stilson	Moderate: seepage.	Severe: piping.	Favorable	Wetness, droughty.	Wetness	Droughty.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
SuB, SuC---------- Susquehanna	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
To---------- Toccoa	Severe: seepage.	Severe: piping.	Flooding-------	Flooding-------	Favorable------	Favorable.
TrB, TrC---------- Troup	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, slope.	Favorable------	Droughty.
TrD---------- Troup	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, slope.	Slope----------	Slope, droughty.
TSD*:						
Troup----------	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, slope.	Slope, too sandy.	Slope, droughty.
Esto----------	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
TVD*:						
Troup----------	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, slope.	Slope, too sandy.	Slope, droughty.
Vaucluse---------	Slight---------	Slight---------	Deep to water	Droughty-------	Slope----------	Slope, droughty, rooting depth.
Pelion----------	Moderate: seepage.	Severe: seepage, piping.	Percs slowly, slope.	Wetness, droughty.	Slope, wetness.	Wetness, slope, droughty.
Ua*, Ub*. Udorthents						
Ud*. Urban land						
VaB---------- Vance	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
VbC2---------- Vance	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
VbD2---------- Vance	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
VeC---------- Vaucluse	Slight---------	Slight---------	Deep to water	Droughty-------	Percs slowly---	Droughty, rooting depth.
VeD---------- Vaucluse	Slight---------	Slight---------	Deep to water	Droughty-------	Slope, percs slowly.	Slope, droughty, rooting depth.
WaB, WaC---------- Wagram	Moderate: seepage.	Slight---------	Deep to water	Droughty, slope.	Favorable------	Droughty.
WbA---------- Wahee	Slight---------	Severe: wetness.	Percs slowly, slope.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
WeC---------- Wedowee	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Slope----------	Slope.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
WeE---------- Wedowee	Severe: slope.	Moderate: piping.	Deep to water	Slope----------	Slope----------	Slope.
WhA---------- Wickham	Moderate: seepage.	Slight---------	Deep to water	Favorable------	Favorable------	Favorable.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AaB, AaC---------- Ailey	0-32	Loamy coarse sand	SM, SP-SM	A-2, A-3	0	85-100	75-100	50-80	5-20	---	NP
	32-43	Sandy loam, sandy clay loam.	SM, SC	A-2, A-4, A-6	0	90-100	75-100	60-90	30-40	23-40	8-16
	43-72	Sandy loam, sandy clay loam.	SM, SC	A-2, A-4, A-6	0	90-100	75-100	55-90	20-40	28-40	8-15
Bh---------- Bibb	0-17	Sandy loam-------	SM, SM-SC, ML, CL-ML	A-2, A-4	0-5	95-100	90-100	60-90	30-60	<25	NP-7
	17-60	Sandy loam, loam, silt loam.	SM, SM-SC, ML, CL-ML	A-2, A-4	0-10	60-100	50-100	40-100	30-90	<30	NP-7
CeB---------- Cecil	0-6	Sandy loam-------	SM, SM-SC	A-2, A-4	0	84-100	80-100	67-90	26-42	<30	NP-6
	6-52	Clay-------------	MH, ML	A-7, A-5	0	97-100	92-100	72-99	55-95	41-80	9-37
	52-80	Variable---------	---	---	---	---	---	---	---	---	---
CfC2---------- Cecil	0-5	Sandy clay loam	SM, SC, CL, ML	A-4, A-6	0	74-100	72-100	68-95	38-81	21-35	3-15
	5-45	Clay-------------	MH, ML	A-7, A-5	0	97-100	92-100	72-99	55-95	41-80	9-37
	45-60	Variable---------	---	---	---	---	---	---	---	---	---
Ch---------- Chastain	0-4	Loam-------------	ML, CL, CL-ML	A-4, A-6, A-7	0	100	100	90-100	70-95	23-45	3-18
	4-46	Silty clay loam, silty clay, clay.	CL, CH, ML, MH	A-6, A-7	0	100	98-100	89-100	68-98	35-75	12-40
	46-60	Silty clay loam, silty clay, sandy clay loam.	CL, CH, ML, MH	A-6, A-7	0	100	100	88-100	51-90	30-78	11-42
Ck---------- Chewacla	0-6	Loam-------------	ML, CL, CL-ML	A-4, A-6, A-7	0	98-100	95-100	70-100	55-90	25-49	4-20
	6-34	Sandy clay loam, loam, sandy loam.	SM, CL-ML, SM-SC, ML	A-4	0	96-100	95-100	60-80	36-70	<35	NP-7
	34-60	Silt loam, clay loam, silty clay loam.	ML, MH	A-4, A-6, A-7	0	75-100	65-100	60-100	51-98	32-61	4-28
Cn---------- Congaree	0-10	Loam-------------	CL-ML, ML, CL	A-4	0	95-100	95-100	70-100	51-90	20-35	3-10
	10-60	Silty clay loam, fine sandy loam, loam.	SC, ML, CL, SM	A-4, A-6, A-7	0	95-100	95-100	70-100	40-90	25-50	3-22
DgA---------- Dogue	0-5	Loam-------------	ML, CL, SM, SC	A-4	0	95-100	75-100	60-100	40-85	<30	NP-10
	5-60	Clay loam, clay, sandy clay loam.	CL, CH, SC	A-6, A-7	0	95-100	75-100	65-100	40-90	35-60	16-40
DoB, DoC---------- Dothan	0-12	Loamy sand-------	SM	A-2	0	95-100	92-100	60-80	13-30	---	NP
	12-36	Sandy clay loam, sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-45	<40	NP-15
	36-60	Sandy clay loam, sandy clay.	SM-SC, SC, SM	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-50	25-45	4-21
DuB*:											
Dothan----------	0-8	Loamy sand-------	SM	A-2	0	95-100	92-100	60-80	13-30	---	NP
	8-36	Sandy clay loam, sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-45	<40	NP-15
	36-60	Sandy clay loam, sandy clay.	SM-SC, SC, SM	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-50	25-45	4-21
Urban land.											

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
EmB---------- Esto	0-9	Sandy loam-------	SM, SM-SC, ML, CL-ML	A-4, A-2	0	95-100	95-100	70-96	34-55	<25	NP-4
	9-60	Clay loam, clay, sandy clay.	CL, CH	A-6, A-7	0	95-100	95-100	90-100	51-98	35-80	18-52
EnE*:											
Esto----------	0-9	Sandy loam-------	SM, SM-SC, ML, CL-ML	A-4, A-2	0	95-100	95-100	70-96	34-55	<25	NP-4
	9-60	Clay loam, clay, sandy clay.	CL, CH	A-6, A-7	0	95-100	95-100	90-100	51-98	35-80	18-52
Urban land.											
EOD*:											
Esto----------	0-10	Loamy sand-------	SM, SP-SM	A-2	0	90-100	90-100	50-85	10-35	---	NP
	10-64	Clay loam, clay, sandy clay.	CL, CH	A-6, A-7	0	95-100	95-100	90-100	51-98	35-80	18-52
Fuquay----------	0-26	Loamy sand-------	SP-SM, SM	A-2, A-3	0	95-100	90-100	50-83	5-35	---	NP
	26-34	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	85-100	85-100	70-90	23-45	<25	NP-13
	34-80	Sandy clay loam	SC	A-2, A-4, A-6	0	95-100	90-100	60-93	28-49	20-49	8-25
Ailey----------	0-24	Loamy sand-------	SM, SP-SM	A-2, A-3	0	85-100	75-100	50-80	5-20	---	NP
	24-44	Sandy loam, sandy clay loam.	SM, SC	A-2, A-4, A-6	0	90-100	75-100	60-90	30-40	23-40	8-16
	44-80	Sandy loam, sandy clay loam.	SM, SC	A-2, A-4, A-6	0	90-100	75-100	55-90	20-40	28-40	8-15
EPE*:											
Esto----------	0-9	Loamy sand-------	SM, SP-SM	A-2	0	90-100	90-100	50-85	10-35	---	NP
	9-60	Clay loam, clay, sandy clay.	CL, CH	A-6, A-7	0	95-100	95-100	90-100	51-98	35-80	18-52
Troup----------	0-50	Loamy sand-------	SM, SP-SM	A-2	0	100	100	50-75	10-30	---	NP
	50-80	Sandy clay loam, sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2	0	95-100	95-100	70-90	24-55	19-30	4-10
EtA----------	0-18	Sandy loam-------	SM	A-2, A-4	0	100	98-100	60-85	30-50	---	NP
Eunola	18-26	Sandy clay loam	SM, SC, SM-SC	A-4	0	100	98-100	75-95	30-45	<30	NP-10
	26-52	Sandy clay loam, sandy clay.	SM, SC, ML, CL	A-4, A-6	0	100	98-100	80-95	36-60	<30	2-15
	52-60	Sandy loam-------	SM	A-2, A-4	0	100	98-100	60-70	30-40	---	NP
EuA*:											
Eunola----------	0-18	Sandy loam-------	SM	A-2, A-4	0	100	98-100	60-85	30-50	---	NP
	18-26	Sandy clay loam	SM, SC, SM-SC	A-4	0	100	98-100	75-95	30-45	<30	NP-10
	26-52	Sandy clay loam, sandy clay.	SM, SC, ML, CL	A-4, A-6	0	100	98-100	80-95	36-60	<30	2-15
	52-60	Sandy loam-------	SM	A-2, A-4	0	100	98-100	60-70	30-40	---	NP
Urban land.											
HsB---------- Hiwassee	0-7	Loam----------	CL, ML, CL-ML	A-7-6, A-6, A-4	0-2	95-100	95-100	90-100	50-85	25-49	5-23
	7-62	Clay, silty clay, clay loam.	CL, ML, MH	A-7-5, A-7-6, A-6	0-2	95-100	95-100	80-100	51-95	40-80	12-36
Hy*. Hydraquents											
LaC, LaE---------- Lakeland	0-36	Sand----------	SP-SM	A-3, A-2-4	0	90-100	90-100	60-100	5-12	---	NP
	36-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	90-100	90-100	50-100	1-12	---	NP

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MaA---------- Masada	0-10	Fine sandy loam	ML, SM, SC, CL	A-4, A-2	0-5	90-100	75-100	60-85	31-70	<30	NP-8
	10-54	Clay loam, clay, gravelly clay.	MH, ML, CH, CL	A-7	0-10	80-100	70-100	65-99	50-94	42-65	19-35
	54-60	Clay loam, gravelly clay loam.	CL	A-6, A-7	0-10	80-100	70-100	65-90	50-80	30-45	15-25
MuA*:											
Masada----------	0-10	Fine sandy loam	ML, SM, SC, CL	A-4	0-5	90-100	75-100	60-85	35-70	<30	NP-8
	10-54	Clay loam, clay, gravelly clay.	MH, ML, CH, CL	A-7	0-10	80-100	70-100	65-90	50-80	45-65	20-35
	54-60	Clay loam, gravelly clay loam.	CL	A-6, A-7	0-10	80-100	70-100	65-90	50-80	30-45	15-25
Urban land.											
OrB, OrC---------- Orangeburg	0-8	Loamy sand-------	SM	A-2	0	98-100	95-100	60-87	14-28	---	NP
	8-13	Sandy loam-------	SM	A-2	0	98-100	95-100	70-96	25-35	<30	NP-4
	13-46	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	6-19
	46-62	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4, A-7	0	98-100	95-100	70-97	40-65	24-46	8-21
OuC*:											
Orangeburg------	0-8	Loamy sand-------	SM	A-2	0	98-100	95-100	60-87	14-28	---	NP
	8-13	Sandy loam-------	SM	A-2	0	98-100	95-100	70-96	25-35	<30	NP-4
	13-46	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	6-19
	46-62	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4, A-7	0	98-100	95-100	70-97	40-65	24-46	8-21
Urban land.											
PfE---------- Pacolet	0-7	Sandy loam-------	SM, SM-SC	A-2, A-1-6	0-2	85-100	80-100	42-80	16-35	<28	NP-7
	7-24	Sandy clay, clay loam, clay.	ML, MH, CL	A-6, A-7	0-1	80-100	80-100	60-95	51-75	38-65	11-30
	24-60	Variable---------	---	---	---	---	---	---	---	---	---
PgC2, PgD2------- Pacolet	0-6	Sandy clay loam	SM-SC, SC	A-4, A-6	0-1	95-100	90-100	65-85	36-50	20-40	4-17
	6-26	Sandy clay, clay loam, clay.	ML, MH, CL	A-6, A-7	0-1	80-100	80-100	60-95	51-75	38-65	11-30
	26-36	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SM-SC, SC	A-2, A-4, A-6	0-2	80-100	70-100	60-80	30-60	20-35	5-15
	36-60	Variable---------	---	---	---	---	---	---	---	---	---
PhC*:											
Pacolet----------	0-3	Sandy loam-------	SM, SM-SC	A-2, A-1-6	0-2	85-100	80-100	42-80	16-35	<28	NP-7
	3-28	Sandy clay, clay loam, clay.	ML, MH, CL	A-6, A-7	0-1	80-100	80-100	60-95	51-75	38-65	11-30
	28-36	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SM-SC, SC	A-2, A-4, A-6	0-2	80-100	70-100	60-80	30-60	20-35	5-15
	36-60	Variable--------- sandy loam, loam.	---	--- A-2-4	---	---	---	---	---	---	---
Urban land.											

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Pm	0-23	Loamy sand	SM	A-2	0	100	95-100	75-90	15-30	---	NP
Pelham	23-54	Sandy clay loam, sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	95-100	65-90	30-50	<30	2-12
	54-72	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC, ML, CL	A-2, A-4, A-6, A-7	0	100	95-100	65-90	30-65	20-45	5-20
Pt*. Pits											
Rx*. Rock outcrop											
SeA	0-30	Loamy sand	SM	A-2	0	94-100	94-100	74-92	15-24	---	NP
Stilson	30-48	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-6, A-4	0	89-100	86-100	77-94	28-41	<29	NP-13
	48-72	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-6, A-4	0	96-100	95-100	70-99	30-50	<40	NP-20
SuB, SuC	0-9	Sandy loam	ML, SM	A-4	0	100	100	65-90	40-55	---	NP
Susquehanna	9-62	Clay, silty clay loam, silty clay.	CH	A-7	0	100	100	88-100	80-98	50-90	28-56
To	0-8	Sandy loam	SM, ML	A-2, A-4	0	98-100	95-100	85-100	25-60	<30	NP-4
Toccoa	8-60	Sandy loam, loam	SM, ML	A-2, A-4	0	95-100	90-100	60-100	30-55	<30	NP-4
TrB, TrC, TrD	0-48	Loamy fine sand	SM	A-2, A-4	0	100	100	65-90	15-40	---	NP
Troup	48-80	Sandy clay loam, sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2	0	95-100	95-100	70-90	24-55	19-30	4-10
TSD*:											
Troup	0-45	Loamy sand	SM, SP-SM	A-2	0	100	100	50-75	10-30	---	NP
	45-80	Sandy clay loam, sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2	0	95-100	95-100	70-90	24-55	19-30	4-10
Esto	0-11	Loamy sand	SM, SP-SM	A-2	0	90-100	90-100	50-85	10-35	---	NP
	11-60	Clay loam, clay, sandy clay.	CL, CH	A-6, A-7	0	95-100	95-100	90-100	51-98	35-80	18-52
TVD*:											
Troup	0-50	Loamy sand	SM, SP-SM	A-2	0	100	100	50-75	10-30	---	NP
	50-80	Sandy clay loam, sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2	0	95-100	95-100	70-90	24-55	19-30	4-10
Vaucluse	0-8	Loamy sand	SM, SP-SM	A-2, A-3	0-5	90-100	90-100	51-70	8-30	---	NP
	8-24	Sandy clay loam, sandy loam.	SC, SM-SC	A-2, A-4, A-6	0-5	90-100	90-100	51-75	25-50	20-40	5-18
	24-60	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC, SM	A-2, A-4, A-6	0-5	95-100	92-100	55-75	20-50	<40	NP-20
Pelion	0-6	Loamy sand	SM, SM-SC	A-2, A-4	0	95-100	90-100	50-90	13-40	<30	NP-7
	6-18	Sandy clay loam, sandy loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	95-100	92-100	50-90	25-55	20-40	5-18
	18-54	Sandy clay loam, sandy clay, clay.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	92-100	50-90	25-60	20-40	5-20
	54-60	Sandy clay loam, sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	98-100	92-100	50-90	18-50	<40	NP-18
Ua*, Ub*. Udorthents											
Ud*. Urban land											

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
VaB---------- Vance	0-6	Sandy loam-------	SM, SM-SC	A-2, A-4	0-5	90-100	80-100	55-80	15-40	<27	NP-7
	6-40	Clay loam, sandy clay, clay.	CH	A-7	0-5	95-100	90-100	75-95	65-80	51-80	25-48
	40-60	Variable---------	---	---	---	---	---	---	---	---	---
VbC2---------- Vance	0-4	Sandy loam-------	SM, SM-SC	A-2, A-4	0-5	90-100	80-100	55-80	15-40	<27	NP-7
	4-36	Clay loam, sandy clay, clay.	CH	A-7	0-5	95-100	90-100	75-95	65-80	51-80	25-48
	36-60	Variable---------	---	---	---	---	---	---	---	---	---
VbD2---------- Vance	0-4	Sandy clay loam	CL, SC	A-6, A-4	0-5	95-100	90-100	70-95	40-70	25-40	8-20
	4-36	Clay loam, sandy clay, clay.	CH	A-7	0-5	95-100	90-100	75-95	65-80	51-80	25-48
	36-60	Variable---------	---	---	---	---	---	---	---	---	---
VeC, VeD---------- Vaucluse	0-6	Sandy loam-------	SM, SM-SC	A-2, A-4	0-5	90-100	90-100	51-70	20-45	<30	NP-7
	6-26	Sandy clay loam, sandy loam.	SC, SM-SC	A-2, A-4, A-6	0-5	90-100	90-100	51-75	25-50	20-40	5-18
	26-54	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC, SM	A-2, A-4, A-6	0-5	95-100	92-100	55-75	20-50	<40	NP-20
	54-62	Sandy loam, sandy clay loam, loamy sand.	SM, SC, SM-SC	A-2, A-4, A-6	0-2	95-100	95-100	51-90	15-50	<30	NP-12
WaB, WaC---------- Wagram	0-36	Loamy sand-------	SM, SP-SM	A-2, A-3	0	100	98-100	50-85	8-35	---	NP
	36-72	Sandy clay loam, sandy loam.	SC	A-2, A-4, A-6, A-7	0	100	98-100	60-95	31-49	21-41	8-25
WbA---------- Wahee	0-12	Fine sandy loam	SM, SM-SC	A-2, A-4	0	100	95-100	50-85	30-50	<28	NP-7
	12-42	Clay, clay loam, silty clay.	CL, CH	A-7, A-6	0	100	100	85-100	50-90	38-60	18-32
	42-68	Variable---------	---	---	---	---	---	---	---	---	---
WeC, WeE---------- Wedowee	0-10	Sandy loam-------	SM, SM-SC	A-4, A-2-4	0	95-100	90-100	60-99	23-50	<30	NP-6
	10-16	Loam, sandy clay loam.	SM, SC, CL, ML	A-4, A-6	0	90-100	90-100	80-97	40-75	<32	NP-15
	16-36	Sandy clay, clay loam, clay.	SC, ML, CL, SM	A-6, A-7	0	95-100	95-100	65-97	45-71	30-58	10-25
	36-60	Variable---------	---	---	---	---	---	---	---	---	---
WhA---------- Wickham	0-13	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	95-100	90-100	70-100	45-80	<25	NP-7
	13-38	Sandy clay loam, clay loam, loam.	CL-ML, CL, SC, SM-SC	A-2, A-4, A-6, A-7-6	0	95-100	90-100	75-100	30-70	20-41	5-15
	38-60	Variable---------	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
							K	T	
	In	Pct	In/hr	In/in	pH				Pct
AaB, AaC----------	0-32	5-10	6.0-20	0.03-0.05	4.5-6.5	Low----------	0.20	4	<1
Ailey	32-43	15-30	0.6-2.0	0.09-0.12	4.5-5.5	Low----------	0.24		
	43-72	18-32	0.06-0.2	0.06-0.10	4.5-5.5	Low----------	0.17		
Bh----------	0-17	2-18	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.20	5	.5-2
Bibb	17-60	2-18	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.37		
CeB----------	0-6	5-20	2.0-6.0	0.12-0.14	4.5-6.0	Low----------	0.28	3	.5-2
Cecil	6-52	40-60	0.6-2.0	0.13-0.15	4.5-5.5	Low----------	0.28		
	52-80	---	---	---	---	----------	----		
CfC2----------	0-5	20-35	0.6-2.0	0.13-0.15	4.5-6.0	Low----------	0.28	3	.5-1
Cecil	5-45	40-60	0.6-2.0	0.13-0.15	4.5-5.5	Low----------	0.28		
	45-60	---	---	---	---	----------	----		
Ch----------	0-4	15-35	0.2-0.6	0.12-0.18	4.5-6.0	Moderate-------	0.32	5	2-6
Chastain	4-60	35-60	0.06-0.2	0.12-0.16	4.5-6.0	Moderate-------	0.37		
Ck----------	0-6	10-27	0.6-2.0	0.15-0.24	4.5-6.5	Low----------	0.28	4	1-4
Chewacla	6-34	18-35	0.6-2.0	0.12-0.20	4.5-6.5	Low----------	0.28		
	34-60	18-35	0.6-2.0	0.15-0.24	4.5-6.5	Low----------	0.32		
Cn----------	0-10	10-25	0.6-2.0	0.12-0.20	4.5-7.3	Low----------	0.37	5	<4
Congaree	10-60	18-35	0.6-2.0	0.12-0.20	4.5-7.3	Low----------	0.37		
DgA----------	0-5	5-15	0.6-2.0	0.14-0.20	3.6-5.5	Low----------	0.37	4	.5-1
Dogue	5-60	35-50	0.2-0.6	0.12-0.19	3.6-5.5	Moderate-------	0.28		
DoB, DoC----------	0-12	5-15	2.0-6.0	0.06-0.10	4.5-5.5	Very low-------	0.20	4	<.5
Dothan	12-36	18-35	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28		
	36-62	18-40	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.28		
DuB*:									
Dothan----------	0-8	5-15	2.0-6.0	0.06-0.10	4.5-5.5	Very low-------	0.20	4	<.5
	8-36	18-35	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28		
	36-60	18-40	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.28		
Urban land.									
EmB----------	0-9	8-20	2.0-6.0	0.11-0.15	4.5-5.5	Low----------	0.28	3	<1
Esto	9-60	35-60	0.06-0.2	0.12-0.18	4.5-5.5	Moderate-------	0.32		
EnE*:									
Esto----------	0-9	8-20	2.0-6.0	0.11-0.15	4.5-5.5	Low----------	0.28	3	<1
	9-60	35-60	0.06-0.2	0.12-0.18	4.5-5.5	Moderate-------	0.32		
Urban land.									
EOD*:									
Esto----------	0-10	7-12	6.0-20	0.06-0.10	4.5-5.5	Low----------	0.24	3	<1
	10-64	35-60	0.06-0.2	0.12-0.18	4.5-5.5	Moderate-------	0.32		
Fuquay----------	0-26	2-10	>6.0	0.04-0.09	4.5-6.0	Low----------	0.15	5	.5-2
	26-34	10-35	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.20		
	34-80	20-35	0.06-0.2	0.10-0.13	4.5-6.0	Low----------	0.20		
Ailey----------	0-24	5-10	6.0-20	0.03-0.05	4.5-6.5	Low----------	0.20	4	<1
	24-44	15-30	0.6-2.0	0.09-0.12	4.5-5.5	Low----------	0.24		
	44-80	18-32	0.06-0.2	0.06-0.10	4.5-5.5	Low----------	0.17		
EPE*:									
Esto----------	0-9	7-12	6.0-20	0.06-0.10	4.5-5.5	Low----------	0.24	3	<1
	9-60	35-60	0.06-0.2	0.12-0.18	4.5-5.5	Moderate-------	0.32		

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
							K	T	
	In	Pct	In/hr	In/in	pH				Pct
EPE*:									
Troup	0-50	1-10	6.0-20	0.03-0.10	4.5-5.5	Very low	0.20	5	<1
	50-80	15-35	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.20		
EtA	0-18	10-17	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.28	4	.5-2
Eunola	18-26	18-35	0.6-2.0	0.12-0.17	4.5-5.5	Low	0.28		
	26-52	18-45	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.32		
	52-60	8-17	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.24		
EuA*:									
Eunola	0-18	10-17	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.28	4	.5-2
	18-26	18-35	0.6-2.0	0.12-0.17	4.5-5.5	Low	0.28		
	26-52	18-45	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.32		
	52-60	8-17	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.24		
Urban land.									
HsB	0-7	10-35	0.6-2.0	0.12-0.15	4.5-6.5	Low	0.28	4	.5-2
Hiwassee	7-62	35-60	0.6-2.0	0.12-0.15	4.5-6.5	Low	0.28		
Hy*.									
Hydraquents									
LaC, LaE	0-36	2-8	>20	0.05-0.08	4.5-6.0	Low	0.17	5	>1
Lakeland	36-80	2-6	>20	0.03-0.08	4.5-6.0	Low	0.17		
MaA	0-10	5-20	2.0-6.0	0.10-0.17	4.5-5.5	Low	0.32	4	1-3
Masada	10-54	35-55	0.6-2.0	0.10-0.17	4.5-5.5	Moderate	0.24		
	54-60	30-40	0.6-2.0	0.10-0.17	4.5-5.5	Moderate	0.24		
MuA*:									
Masada	0-10	5-20	2.0-6.0	0.10-0.17	4.5-5.5	Low	0.32	4	1-3
	10-54	35-55	0.6-2.0	0.10-0.17	4.5-5.5	Moderate	0.24		
	54-60	30-40	0.6-2.0	0.10-0.17	4.5-5.5	Moderate	0.24		
Urban land.									
OrB, OrC	0-8	4-10	2.0-6.0	0.06-0.09	4.5-6.0	Low	0.10	5	.5-1
Orangeburg	8-13	7-18	2.0-6.0	0.09-0.12	4.5-6.0	Low	0.20		
	13-46	18-35	0.6-2.0	0.11-0.14	4.5-5.5	Low	0.24		
	46-62	20-45	0.6-2.0	0.11-0.14	4.5-5.5	Low	0.24		
OuC*:									
Orangeburg	0-8	4-10	2.0-6.0	0.06-0.09	4.5-6.0	Low	0.10	5	.5-1
	8-13	7-18	2.0-6.0	0.09-0.12	4.5-6.0	Low	0.20		
	13-46	18-35	0.6-2.0	0.11-0.14	4.5-5.5	Low	0.24		
	46-62	20-45	0.6-2.0	0.11-0.14	4.5-5.5	Low	0.24		
Urban land.									
PfE	0-7	8-20	2.0-6.0	0.08-0.12	4.5-6.5	Low	0.28	3	.5-2
Pacolet	7-24	35-65	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.28		
	24-60	10-25	0.6-2.0	0.08-0.15	4.5-6.0	Low	0.28		
PgC2, PgD2	0-6	20-35	0.6-2.0	0.10-0.14	4.5-6.5	Low	0.24	2	.5-1
Pacolet	6-26	35-65	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.28		
	26-36	15-30	0.6-2.0	0.08-0.15	4.5-6.0	Low	0.28		
	36-60	10-25	0.6-2.0	0.08-0.15	4.5-6.0	Low	0.28		
PhC*:									
Pacolet	0-3	8-20	2.0-6.0	0.08-0.12	4.5-6.5	Low	0.28	3	.5-2
	3-28	35-65	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.28		
	28-36	15-30	0.6-2.0	0.08-0.15	4.5-6.0	Low	0.28		
	36-60	10-25	0.6-2.0	0.08-0.15	4.5-6.0	Low	0.28		
Urban land.									
Pm	0-23	5-10	6.0-20	0.05-0.08	4.5-5.5	Very low	0.10	5	1-2
Pelham	23-54	15-30	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.24		
	54-72	15-40	0.6-2.0	0.10-0.16	4.5-5.5	Low	0.24		

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
							K	T	
	In	Pct	In/hr	In/in	pH				Pct
Pt*. Pits									
Rx*. Rock outcrop									
SeA	0-30	3-8	6.0-20	0.06-0.09	4.5-5.5	Low	0.17	5	.5-1
Stilson	30-48	15-30	0.6-2.0	0.09-0.12	4.5-5.5	Low	0.24		
	48-72	18-35	0.6-2.0	0.08-0.10	4.5-5.5	Low	0.17		
SuB, SuC	0-9	2-12	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.43	3	.5-2
Susquehanna	9-62	35-60	<0.06	0.15-0.20	4.5-5.5	High	0.32		
To	0-8	3-17	2.0-6.0	0.09-0.12	5.1-6.5	Low	0.10	4	1-2
Toccoa	8-60	2-19	2.0-6.0	0.09-0.12	5.1-6.5	Low	0.10		
TrB, TrC, TrD	0-48	1-10	6.0-20	0.05-0.10	4.5-5.5	Very low	0.17	5	<1
Troup	48-80	15-35	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.20		
TSD*:									
Troup	0-45	1-10	6.0-20	0.03-0.10	4.5-5.5	Very low	0.20	5	<1
	45-80	15-35	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.20		
Esto	0-11	7-12	6.0-20	0.06-0.10	4.5-5.5	Low	0.24	3	<1
	11-60	35-60	0.06-0.2	0.12-0.18	4.5-5.5	Moderate	0.32		
TVD*:									
Troup	0-50	1-10	6.0-20	0.03-0.10	4.5-5.5	Very low	0.20	5	<1
	50-80	15-35	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.20		
Vaucluse	0-8	2-10	6.0-20	0.04-0.08	4.5-6.0	Low	0.15	3	<1
	8-24	18-35	0.6-6.0	0.10-0.15	3.6-5.5	Low	0.24		
	24-60	18-45	0.06-0.6	0.04-0.08	3.6-5.5	Low	0.24		
Pelion	0-6	5-15	2.0-6.0	0.03-0.10	4.5-6.5	Low	0.24	3	.5-2
	6-18	18-35	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.17		
	18-54	25-50	0.06-0.6	0.06-0.10	3.6-5.5	Low	0.20		
	54-60	10-40	0.6-2.0	0.06-0.10	3.6-5.5	Low	0.15		
Ua*, Ub*. Udorthents									
Ud*. Urban land									
VaB	0-6	8-20	2.0-6.0	0.10-0.14	4.5-6.0	Low	0.28	3	.5-2
Vance	6-40	35-60	0.06-0.2	0.12-0.15	4.5-5.5	Moderate	0.37		
	40-60	---	---	---	---	---	---		
VbC2	0-4	8-20	2.0-6.0	0.10-0.14	4.5-6.0	Low	0.28	3	.5-2
Vance	4-36	35-60	0.06-0.2	0.12-0.15	4.5-5.5	Moderate	0.37		
	36-60	---	---	---	---	---	---		
VbD2	0-4	20-35	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.37	1	.5-1
Vance	4-36	35-60	0.06-0.2	0.12-0.15	4.5-5.5	Moderate	0.37		
	36-60	---	---	---	---	---	---		
VeC, VeD	0-6	10-20	2.0-6.0	0.08-0.12	4.5-6.0	Low	0.17	3	<1
Vaucluse	6-26	18-35	0.6-6.0	0.10-0.15	3.6-5.5	Low	0.24		
	26-54	18-45	0.06-0.6	0.04-0.08	3.6-5.5	Low	0.24		
	54-62	5-30	2.0-6.0	0.04-0.08	3.6-5.5	Low	0.17		
WaB, WaC	0-36	2-10	6.0-20	0.05-0.08	4.5-6.0	Low	0.15	5	.5-2
Wagram	36-72	10-35	0.6-2.0	0.12-0.16	4.5-6.0	Low	0.20		
WbA	0-12	5-20	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.28	5	.5-5
Wahee	12-42	35-55	0.06-0.2	0.12-0.20	4.5-5.5	Moderate	0.28		
	42-68	---	0.2-0.6	0.12-0.20	4.5-5.5	Moderate	0.28		

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
							K	T	
	In	Pct	In/hr	In/in	pH				Pct
WeC, WeE----------	0-10	6-20	2.0-6.0	0.10-0.18	4.5-5.5	Low----------	0.24	2	<1
Wedowee	10-16	14-30	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.28		
	16-36	35-45	0.6-2.0	0.12-0.18	4.5-5.5	Moderate-------	0.28		
	36-60	---	---	---	---	----------	----		
WhA----------	0-13	8-15	2.0-6.0	0.11-0.16	4.5-6.0	Low----------	0.20	5	.5-2
Wickham	13-38	18-25	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.24		
	38-60	---	---	---	---	----------	----		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
AaB, AaC---------- Ailey	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Bh---------- Bibb	C	Frequent-----	Brief-----	Dec-May	0.5-1.5	Apparent	Dec-Apr	>60	---	High-----	Moderate.
CeB, CfC2---------- Cecil	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Ch---------- Chastain	D	Occasional	Very long	Dec-Apr	0-1.0	Apparent	Nov-May	>60	---	High-----	High.
Ck---------- Chewacla	C	Occasional	Brief-----	Nov-Apr	0.5-1.5	Apparent	Nov-Apr	>60	---	High-----	Moderate.
Cn---------- Congaree	B	None--------	---	---	2.5-4.0	Apparent	Nov-Apr	>60	---	Moderate	Moderate.
DgA---------- Dogue	C	None--------	---	---	1.5-3.0	Apparent	Jan-Mar	>60	---	High-----	High.
DoB, DoC---------- Dothan	B	None--------	---	---	3.0-5.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
DuB*: Dothan----------	B	None--------	---	---	3.0-5.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
Urban land.											
EmB---------- Esto	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
EnE*: Esto----------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
Urban land.											
EOD*: Esto----------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
Fuquay----------	B	None--------	---	---	4.0-6.0	Perched	Jan-Mar	>60	---	Low------	High.
Ailey----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
EPE*: Esto----------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
Troup----------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
EtA---------- Eunola	C	Rare--------	---	---	1.5-2.5	Apparent	Nov-Mar	>60	---	Low------	High.
EuA*: Eunola----------	C	Rare--------	---	---	1.5-2.5	Apparent	Nov-Mar	>60	---	Low------	High.
Urban land.											
HsB---------- Hiwassee	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Hy*. Hydraquents											
LaC, LaE---------- Lakeland	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
MaA---------- Masada	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
MuA*: Masada----------	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
Urban land.											
OrB, OrC---------- Orangeburg	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
OuC*: Orangeburg-------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Urban land.											
PfE, PgC2, PgD2--- Pacolet	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
PhC*: Pacolet----------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
Urban land.											
Pm---------- Pelham	B/D	Common------	Brief-----	Dec-Mar	0.5-1.5	Apparent	Jan-Apr	>60	---	High-----	High.
Pt*. Pits											
Rx*. Rock outcrop											
SeA---------- Stilson	B	None--------	---	---	2.5-3.0	Perched	Dec-Apr	>60	---	Moderate	High.
SuB, SuC---------- Susquehanna	D	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
To---------- Toccoa	B	Occasional	Brief-----	Dec-Apr	2.5-5.0	Apparent	Dec-Apr	>60	---	Low------	Moderate.
TrB, TrC, TrD----- Troup	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
TSD*: Troup----------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Esto----------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
TVD*: Troup----------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Vaucluse---------	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
Pelion----------	B/D	None--------	---	---	1.0-2.5	Perched	Nov-Apr	>60	---	High-----	High.
Ua*, Ub*. Udorthents											
Ud*. Urban land											
VaB, VbC2, VbD2--- Vance	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
VeC, VeD---------- Vaucluse	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
WaB, WaC---------- Wagram	A	None---------	---	---	>6.0	---	---	>60	---	Low------	High.
WbA---------- Wahee	D	Occasional	Brief-----	Dec-Apr	0.5-1.5	Apparent	Dec-Mar	>60	---	High-----	High.
WeC, WeE---------- Wedowee	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High.
WhA---------- Wickham	B	None to rare	---	---	>6.0	---	---	>60	---	Moderate	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 19.--ENGINEERING INDEX TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution							Liquid limit	Plasticity index	Moisture density		Percentage volume change		
			Percentage passing sieve--				Percentage smaller than--									
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture	Total	Swell	Shrink
										Pct		Lb/ft^3	Pct	Pct	Pct	Pct
Chastain loam:[1] (S78GA-510-003)																
B1g------17 to 24	A-6 (07)	ML	100	98	89	68	58	43	34	37	12	103	18	26.1	22.6	3.5
B21g-----24 to 36	A-6 (09)	CL	100	100	92	70	62	47	37	37	14	104	19	27.7	23.0	4.7
B22g-----36 to 60	A-6 (08)	CL	100	100	88	67	58	46	37	38	14	102	19	29.7	24.4	5.3
Masada fine sandy loam:[2] (S78GA-510-002)																
A1--------0 to 3	A-2-4(00)	SM	100	94	84	31	22	15	12	--	NP	111	13	10.9	9.7	1.2
B21t-----17 to 25	A-7-6(17)	CL	100	98	97	86	75	51	42	42	19	104	18	26.3	19.2	7.1
B22t-----25 to 46	A-7-5(32)	MH	100	100	99	94	89	65	50	59	28	94	24	28.3	22.9	5.4

[1]Chastain loam: Taxadjunct-The B horizon has more sand than is normal for the series. Northeast of Columbus; 3.4 miles east-southeast of the junction of Chatsworth Road and the 10th Armored Division Road.

[2]Masada fine sandy loam: Taxadjunct-Silt content is higher than defined for the series. South of Columbus; 0.4 mile south of the junction of Victory Drive and South Lumpkin Road; 1.0 mile west of South Lumpkin Road.

TABLE 20.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Ailey	Loamy, siliceous, thermic Arenic Fragiudults
Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents
Cecil	Clayey, kaolinitic, thermic Typic Hapludults
Chastain	Fine, kaolinitic, acid, thermic Typic Fluvaquents
Chewacla	Fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts
Congaree	Fine-loamy, mixed, nonacid, thermic Typic Udifluvents
*Dogue	Clayey, mixed, thermic Aquic Hapludults
Dothan	Fine-loamy, siliceous, thermic Plinthic Paleudults
Esto	Clayey, kaolinitic, thermic Typic Paleudults
Eunola	Fine-loamy, siliceous, thermic Aquic Hapludults
Fuquay	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Hiwassee	Clayey, kaolinitic, thermic Typic Rhodudults
Hydraquents	Hydraquents
Lakeland	Thermic, coated Typic Quartzipsamments
*Masada	Clayey, mixed, thermic Typic Hapludults
Orangeburg	Fine-loamy, siliceous, thermic Typic Paleudults
Pacolet	Clayey, kaolinitic, thermic Typic Hapludults
Pelham	Loamy, siliceous, thermic Arenic Paleaquults
Pelion	Fine-loamy, siliceous, thermic Aquic Hapludults
Stilson	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Susquehanna	Fine, montmorillonitic, thermic Vertic Paleudalfs
Toccoa	Coarse-loamy, mixed, nonacid, thermic Typic Udifluvents
Troup	Loamy, siliceous, thermic Grossarenic Paleudults
Udorthents	Udorthents
Vance	Clayey, mixed, thermic Typic Hapludults
Vaucluse	Fine-loamy, siliceous, thermic Typic Hapludults
Wagram	Loamy, siliceous, thermic Arenic Paleudults
Wahee	Clayey, mixed, thermic Aeric Ochraquults
Wedowee	Clayey, kaolinitic, thermic Typic Hapludults
Wickham	Fine-loamy, mixed, thermic Typic Hapludults

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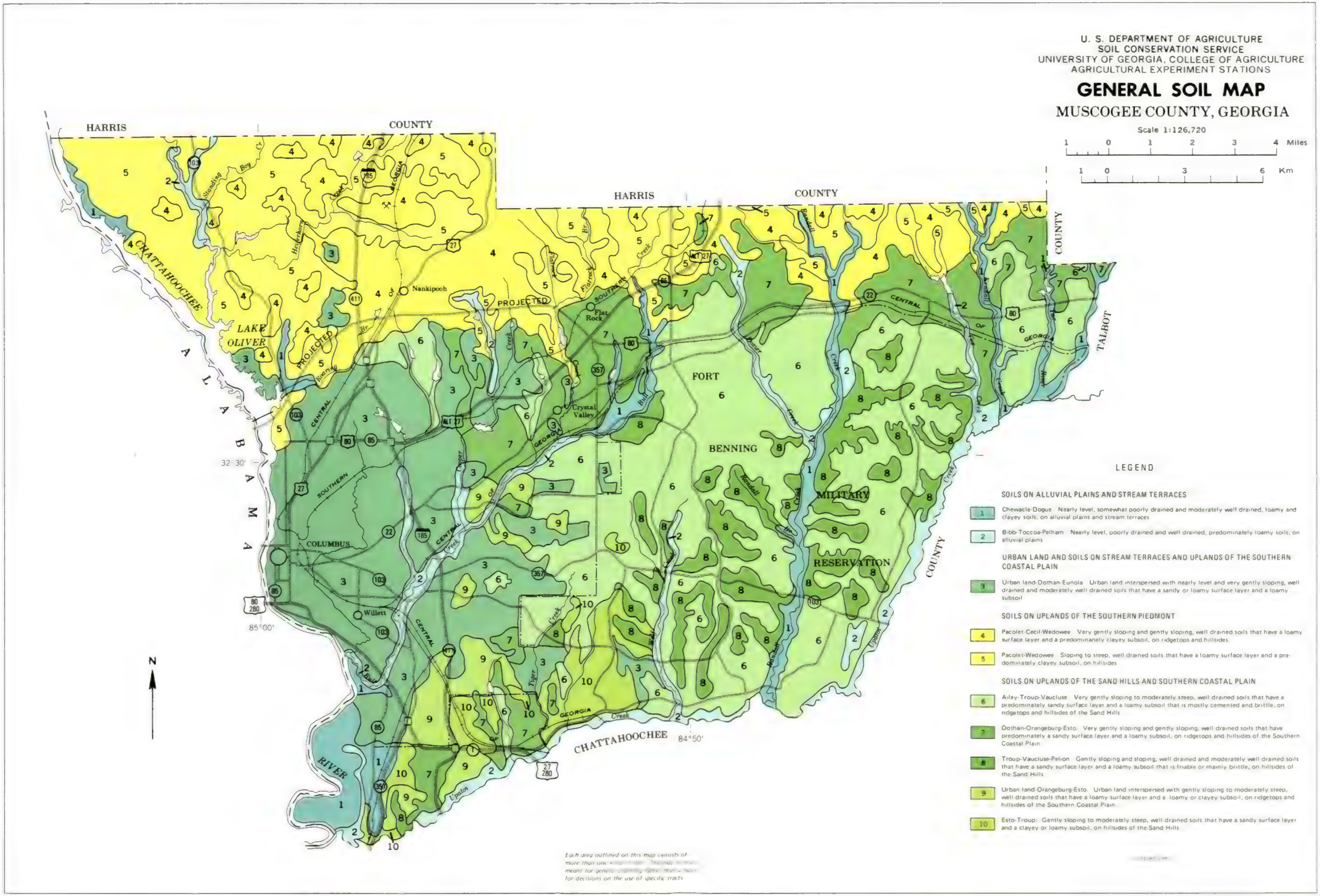


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATIONS
GENERAL SOIL MAP
MUSCOGEE COUNTY, GEORGIA
Scale 1:126,720
1 0 1 2 3 4 Miles
1 0 3 6 Km
HARRIS COUNTY
HARRIS COUNTY
TALBOT COUNTY
UPSON COUNTY
ALABAMA
CHATTAHOOCHEE RIVER
LAKE OLIVER
FORT BENNING MILITARY RESERVATION
COLUMBUS
Nankipooh
Flat Rock
Crystal Valley
Willett
32°30'
85°00'
84°50'
N
LEGEND
SOILS ON ALLUVIAL PLAINS AND STREAM TERRACES
1 Chewacla-Dogue Nearly level, somewhat poorly drained and moderately well drained, loamy and clayey soils, on alluvial plains and stream terraces
2 Bibb-Toccoa-Pelham Nearly level, poorly drained and well drained, predominately loamy soils, on alluvial plains
URBAN LAND AND SOILS ON STREAM TERRACES AND UPLANDS OF THE SOUTHERN COASTAL PLAIN
3 Urban land-Dothan-Eunola Urban land interspersed with nearly level and very gently sloping, well drained and moderately well drained soils that have a sandy or loamy surface layer and a loamy subsoil
SOILS ON UPLANDS OF THE SOUTHERN PIEDMONT
4 Pacolet-Cecil-Wedowee Very gently sloping and gently sloping, well drained soils that have a loamy surface layer and a predominanely clayey subsoil, on ridgetops and hillsides
5 Pacolet-Wedowee Sloping to steep, well drained soils that have a loamy surface layer and a predominately clayey subsoil, on hillsides
SOILS ON UPLANDS OF THE SAND HILLS AND SOUTHERN COASTAL PLAIN
6 Ailey-Troup-Vaucluse Very gently sloping to moderately steep, well drained soils that have a predominately sandy surface layer and a loamy subsoil that is mostly cemented and brittle, on ridgetops and hillsides of the Sand Hills
7 Dothan-Orangeburg-Esto. Very gently sloping and gently sloping, well drained soils that have predominately a sandy surface layer and a loamy subsoil, on ridgetops and hillsides of the Southern Coastal Plain
8 Troup-Vaucluse-Pelion Gently sloping and sloping, well drained and moderately well drained soils that have a sandy surface layer and a loamy subsoil that is friable or mainly brittle, on hillsides of the Sand Hills
9 Urban land-Orangeburg-Esto. Urban land interspersed with gently sloping to moderately steep, well drained soils that have a loamy surface layer and a loamy or clayey subsoil, on ridgetops and hillsides of the Southern Coastal Plain
10 Esto-Troup: Gently sloping to moderately steep, well drained soils that have a sandy surface layer and a clayey or loamy subsoil, on hillsides of the Sand Hills
Each area outlined on this map consists of

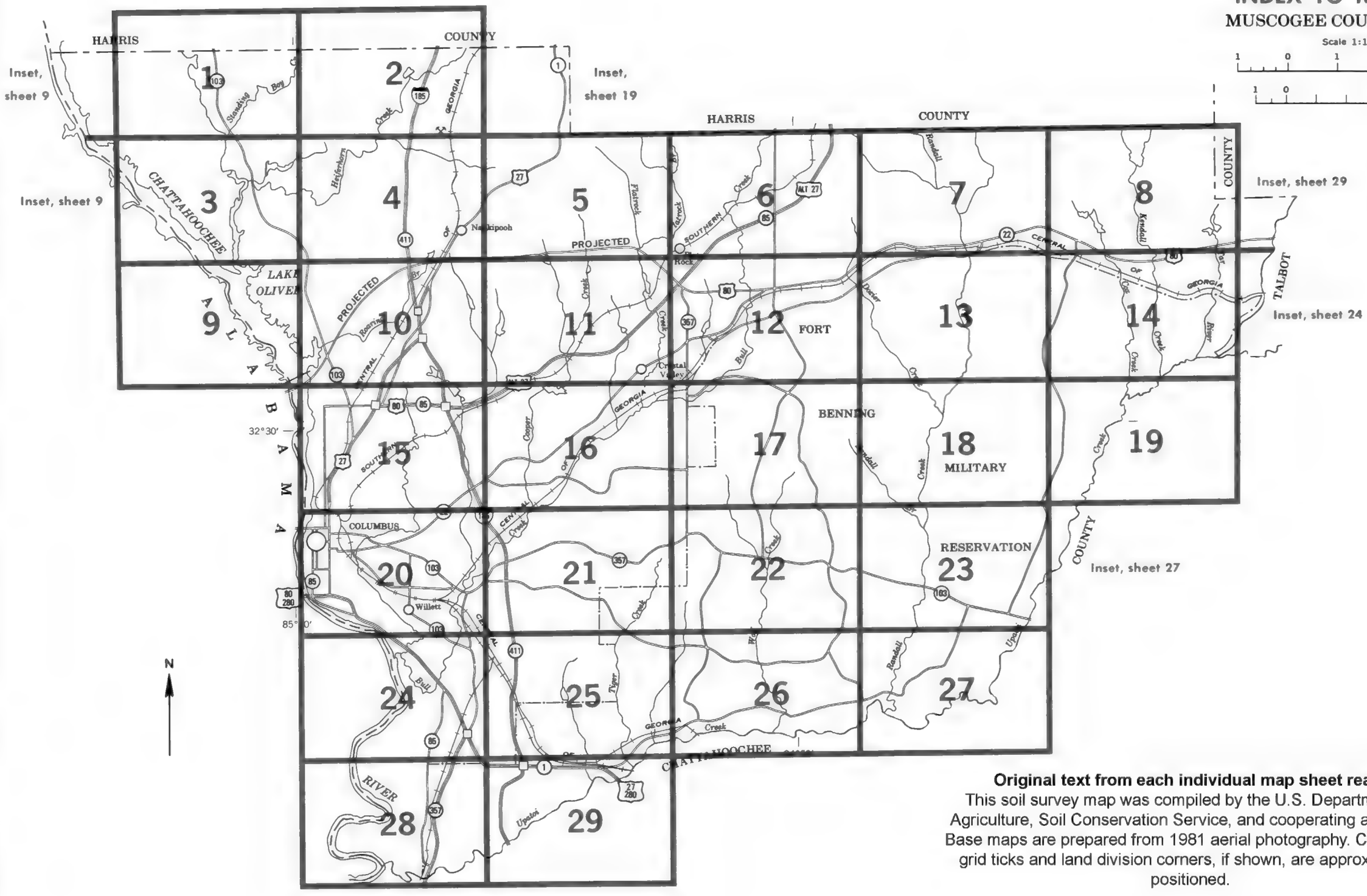
INDEX TO MAP SHEETS

MUSCOGEE COUNTY, GEORGIA

Scale 1:126,720

1 0 1 2 3 4 Miles

1 0 3 6 Km



Original text from each individual map sheet read:

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL LEGEND

The first letter of the map symbol, always a capital, is the initial letter of the soil name. The second letter is a capital, if the mapping unit is broadly defined 1/ otherwise, it is a small letter. The third letter, if used, is a capital letter and connotes slope class. Symbols without a slope letter are for level soils or miscellaneous areas. A final number 2 in the symbol shows the soil is eroded.

1/ The composition of broadly defined units is apt to be more variable than the other units in the survey area. However, mapping has been controlled well enough to be interpreted for the anticipated uses of the areas involved.

SYMBOL	NAME
AaB	Ailey loamy coarse sand, 2 to 5 percent slopes
AaC	Ailey loamy coarse sand, 5 to 8 percent slopes
Bh	Bibb sandy loam
CeB	Cecil sandy loam, 2 to 6 percent slopes
CfC2	Cecil sandy clay loam, 6 to 10 percent slopes, eroded
Ch	Chastain loam
Ck	Chewacla loam
Cn	Congaree loam
DgA	Dogue loam, 1 to 2 percent slopes
DoB	Dothan loamy sand, 2 to 5 percent slopes
DoC	Dothan loamy sand, 5 to 8 percent slopes
DuB	Dothan-Urban land complex, 2 to 5 percent slopes
EmB	Esto sandy loam, 2 to 5 percent slopes
EnE	Esto-Urban land complex, 8 to 25 percent slopes
EOD	Esto, Fuquay, and Ailey loam sands, 5 to 12 percent slopes
EPE	Esto and Troup loamy sands, 12 to 25 percent slopes
EtA	Eunola sandy loam, 0 to 3 percent slopes
EuA	Eunola-Urban land complex, 0 to 3 percent slopes
HsB	Hiwassee loam, 2 to 6 percent slopes
Hy	Hydraquents, loamy
LaC	Lakeland sand, 5 to 10 percent slopes
LaE	Lakeland sand, 10 to 25 percent slopes
MaA	Masada fine sandy loam, 0 to 3 percent slopes
MuA	Masada-Urban land complex, 0 to 3 percent slopes
OrB	Orangeburg loamy sand, 2 to 5 percent slopes
OrC	Orangeburg loamy sand, 5 to 8 percent slopes
OuC	Orangeburg-Urban land complex, 2 to 8 percent slopes
PfE	Pacolet sandy loam, 15 to 25 percent slopes
PgC2	Pacolet sandy clay loam, 6 to 10 percent slopes, eroded
PgD2	Pacolet sandy clay loam, 10 to 15 percent slopes, eroded
PhC	Pacolet-Urban land complex, 2 to 10 percent slopes
Pm	Pelham loamy sand
Pt	Pits, quarry
Rx	Rock outcrop
SeA	Stilson loamy sand, 0 to 3 percent slopes
SuB	Susquehanna sandy loam, 2 to 5 percent slopes
SuC	Susquehanna sandy loam, 5 to 8 percent slopes
To	Toccoa sandy loam
TrB	Troup loamy fine sand, 2 to 5 percent slopes
TrC	Troup loamy fine sand, 5 to 8 percent slopes
TrD	Troup loamy fine sand, 8 to 12 percent slopes
TSD	Troup and Esto loamy sands, 5 to 15 percent slopes
TVD	Troup, Vaucluse, and Pelion loamy sands, 8 to 15 percent slopes
Ua	Udorthents, loamy
Ub	Udorthents, clayey
Ud	Urban land
VaB	Vance sandy loam, 2 to 6 percent slopes
VbC2	Vance sandy clay loam, 6 to 10 percent slopes, eroded
VbD2	Vance sandy clay loam, 10 to 15 percent slopes, eroded
VeC	Vaucluse sandy loam, 5 to 8 percent slopes
VeD	Vaucluse sandy loam, 8 to 15 percent slopes
WaB	Wagram loamy sand, 2 to 5 percent slopes
WaC	Wagram loamy sand, 5 to 8 percent slopes
WbA	Wahee fine sandy loam, 0 to 2 percent slopes
WeC	Wedowee sandy loam, 6 to 10 percent slopes
WeE	Wedowee sandy loam, 10 to 35 percent slopes
WhA	Wickham fine sandy loam, 0 to 2 percent slopes

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline
- AD HOC BOUNDARY (label)
- Small airport, airfield, park, oilfield, cemetery, or flood pool
- STATE COORDINATE TICK
- LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate
- Federal
- State
- County, farm or ranch

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label)
- Located object (label)
- Tank (label)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial
- Intermittent

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

- SOIL DELINEATIONS AND SYMBOLS
- ESCARPMENTS
  - Bedrock (points down slope)
  - Other than bedrock (points down slope)
- SHORT STEEP SLOPE
- GULLY
- DEPRESSION OR SINK
- SOIL SAMPLE SITE (normally not shown)
- MISCELLANEOUS
  - Blowout
  - Clay spot
  - Gravelly spot
  - Gumbo, slick or scabby spot (sodic)
  - Dumps and other similar non soil areas
  - Prominent hill or peak
  - Rock outcrop (includes sandstone and shale)
  - Saline spot
  - Sandy spot
  - Severely eroded spot
  - Slide or slip (tips point upslope)
  - Stony spot, very stony spot
  - Borrow area (1/3 to 3 acres in size)
  - Power substation
- Underground cable

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 1

225 000 FEET

950 000 FEET

HARRIS COUNTY

(Joins inset A, sheet 9)

(Joins sheet 2)

945 000 FEET

240 000 FEET

(Joins sheet 3)

N

Scale · 1:15 840

5 000 Feet

1 Kilometer

2

N

5,000 Feet

1 Kilometer

Scale - 1:15840

260,000 FEET

945,000 FEET

245,000 FEET

HARRIS COUNTY

(Joins sheet 1)

(Joins sheet 4)

(Joins inset, sheet 19)

Standing Bow Creek

Heiferhorn Creek

CENTRAL OF GEORGIA

Barin

Fortson

water

PfE PgD2 PgC2 WeE WeC CfC2 CeB VbD2 VbC2 To VaB HsB Pt Ck

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 3

225 000 FEET

(Joins inset B, sheet 9) 940 000 FEET

(Joins sheet 1)

CHATTAHOOCHEE RIVER

LEE COUNTY, ALABAMA

LAKE OLIVER

STANDING BOY CREEK

Bigger's Lake

Heifer Horn Creek

Twin Lakes

(Joins sheet 4)

(Joins sheet 9)

240 000 FEET

930 000 FEET

N

5,000 Feet

1 Kilometer

Scale - 1:15840

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 4

(4)

N

(Joins sheet 2)

260,000 FEET

940,000 FEET

5,000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 3)

930,000 FEET

245,000 FEET

(Joins sheet 10)

(Joins sheet 5)

Tuin Lakes

Heifermorn Creek

Chapman Creek

Highland Pines

Nankipoon

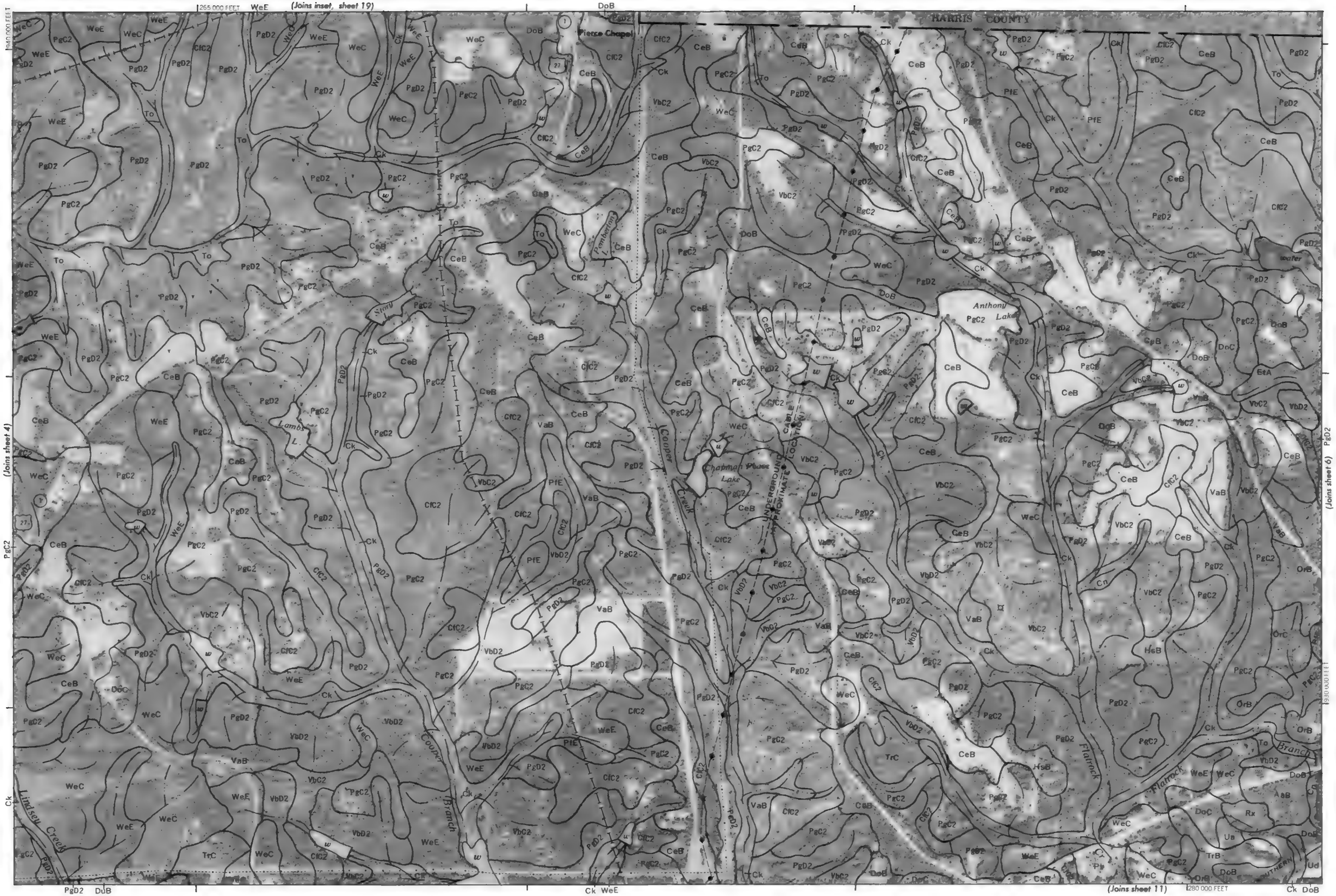
Ud

DuB

PhC

water

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 5



5

N

5000 Feet

1 Kilometer

Scale - 1:15840

6

N

HARRIS COUNTY

300 000 FEET

940 000 FEET

930 000 FEET

285 000 FEET

Midland

Flatrock Branch

Bull Creek

Scale - 1:15840

5000 Feet

1 Kilometer

0 .5 0

1000 2000 3000 4000 5000

(Joins sheet 5)

(Joins sheet 7)

(Joins sheet 12)

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 7

HARRIS COUNTY

7

N

305 000 FEET

940 000 FEET

(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 13)

930 000 FEET

320 000 FEET

5 000 Feet

1 Kilometer

Scale - 1:15840

Randall Creek

MILITARY RESERVATION BOUNDARY

CENTRAL OF GEORGIA

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 8

8

N

HARRIS COUNTY

335 000 FEET

940 000 FEET

TALBOT COUNTY

5 000 Feet

1 Kilometer

Scale - 1:15 840

0 1 000 2 000 3 000 4 000 5 000

930 000 FEET

320 000 FEET

(Joins sheet 7)

(Joins sheet 14)

(Joins inset, sheet 29)

Boyd Branch

Kendall Creek

Cox Creek

Tar River

Lake

Upatoi

water

PgD2 CeB CfC2 WeC VaB DoB VbC2 PgC2 Ck To HsB OrB VbD2 EmB Bh WaB AaB AaC Ua TrC VeD VeC TrB DoC DoB TSD EmB WeE PfE Pm SuB TrD

N

225 000 FEET

925 000 FEET

950 000 FEET

219 000 FEET

HARRIS COUNTY

CHATTAHOOCHEE RIVER

LEE COUNTY

ALABAMA

LAKE OLIVER

(Joins sheet 1)

945 000 FEET

(Joins inset B,upper right)

224 000 FEET

INSET A

(Joins sheet 3)

CHATTAHOOCHEE RIVER

LEE COUNTY

ALABAMA

Green Island Hills

LAKE OLIVER

(Joins sheet 10)

915 000 FEET

240 000 FEET

(Joins inset A,lower left)

220 000 FEET

941 000 FEET

LAKE OLIVER

CHATTAHOOCHEE RIVER

LEE COUNTY

ALABAMA

(Joins sheet 3)

937 000 FEET

224 000 FEET

4000-FOOT GRID TICKS

INSET B

5 000 Feet

1 Kilometer

Scale - 1:15840

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 10

10

N

(Joins sheet 4)

260 000 FEET

925 000 FEET

915 000 FEET

245 000 FEET (Joins sheet 15)

(Joins sheet 9)

(Joins sheet 11)

5 000 Feet

1 Kilometer

Scale - 1:15840

Green Island Hills

Laurel Hills

Caroline Park

LAKE OLIVER

Roaring Branch

Roaring Branch

CENTRAL OF GEORGIA

CENTRAL OF GEORGIA

Glenns

Lake Somerset

COLUMBUS METROPOLITAN AIRPORT

(UNDERGROUND CABLE APPROXIMATE LOCATION)

water

PgD2 WeE WeC PgC2 CeB DuB PhC Ck CfC2 VbC2 VaB PfE To Ub DoB HsB Ud AaB AaC DoC OuC OrC TrB TrC TrD VeC VeD EmB Bh TSB

11

N

265 000 FEET

925 000 FEET

(Joins sheet 5)

(Joins sheet 10)

(Joins sheet 12)

(Joins sheet 16) 280 000 FEET

915 000 FEET

UNDERGROUND CABLE (APPROXIMATE LOCATION)

Lyn Hills

Klondale

Lindsey Ct

Lindsey Creek

Cooper Branch

Cooper Creek

Flatrock Park Lake

Flatrock Creek

Southern

water

5 000 Feet

1 Kilometer

Scale - 1:15840

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 12

12

N

5,000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 6)

(Joins sheet 11)

(Joins sheet 17)

(Joins sheet 13)

300 000 FEET

925 000 FEET

915 000 FEET

285 000 FEET

FORT BENNING

MILITARY RESERVATION

CENTRAL OF GEORGIA

Lake Pines

Bull Creek

Britton Ponds

Bull Creek

Chattahoochee

GEORGIA MILITARY BOUNDARY

MILITARY RESERVATION BOUNDARY

13

N

305 000 FEET

925 000 FEET

(Joins sheet 7)

(Joins sheet 12)

(Joins sheet 14)

(Joins sheet 18)

320 000 FEET

915 000 FEET

FORT BENNING MILITARY RESERVATION

MILITARY RESERVATION BOUNDARY

CENTRAL OF GEORGIA

Dozier Creek

Randall Creek

Scale - 1:15840

5,000 Feet

1 Kilometer

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 14

14

N

5,000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 8)

(Joins sheet 13)

(Joins sheet 19)

(Joins inset, sheet 24)

335 000 FEET

320 000 FEET

915 000 FEET

925 000 FEET

FORT BENNING MILITARY RESERVATION

MILITARY RESERVATION BOUNDARY

CENTRAL OF GEORGIA

TALBOT COUNTY

CHATTAHOOCHEE COUNTY

Upatoi

Upatoi Creek

Cox Creek

Kendall Creek

Tar River

Baker Creek

water

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 15

15

N

LEE COUNTY

ALABAMA

245 000 FEET

910 000 FEET

(Joins sheet 10)

COLUMBUS METROPOLITAN AIRPORT

Heards Lake

Lindsey Creek

CHATTAHOOCHEE RIVER

RUSSELL COUNTY ALABAMA

Cascade Hills

Bibb City

COLUMBUS

Ross Hill Heights

East Highland

Glubview Heights

Hilton Heights

Highland Park

Wentoba Creek

CENTRAL OF GEORGIA

SOUTHERN

CEMETERY

DuB

OuC

PfE

PfC2

Ck

Ud

EuA

Bh

AsC

To

TrC

(Joins sheet 16)

(Joins sheet 20)

260 000 FEET

5 000 Feet

1 Kilometer

Scale - 1:15840

16

N

(Joins sheet 11)

280 000 FEET

910 000 FEET

(Joins sheet 15)

(Joins sheet 17)

(Joins sheet 21)

265 000 FEET

5 000 Feet 0 1 Kilometer 0 .5 1

Scale - 1:15840

Lindsey Creek

Cooper Creek

Flatrock Creek

Bull Creek

Mill Branch

Woodlawn

Edgewood

East Edgewood

Lake Crystal

water

CEMETERY

SOUTHERN

CENTRAL

GEORGIA

RAILROAD

Ud DuB DuC DoB DoC EuA AaB AaC EmB EnE TrC TrD VeD VeC OrB OrC OuC SeA EtA WaB WaC LaE Bh Ck To TSD Pm

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 17

17

N

18

N

5,000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 13)

320 000 FEET

910 000 FEET

905 000 FEET

305 000 FEET

(Joins sheet 17)

(Joins sheet 19)

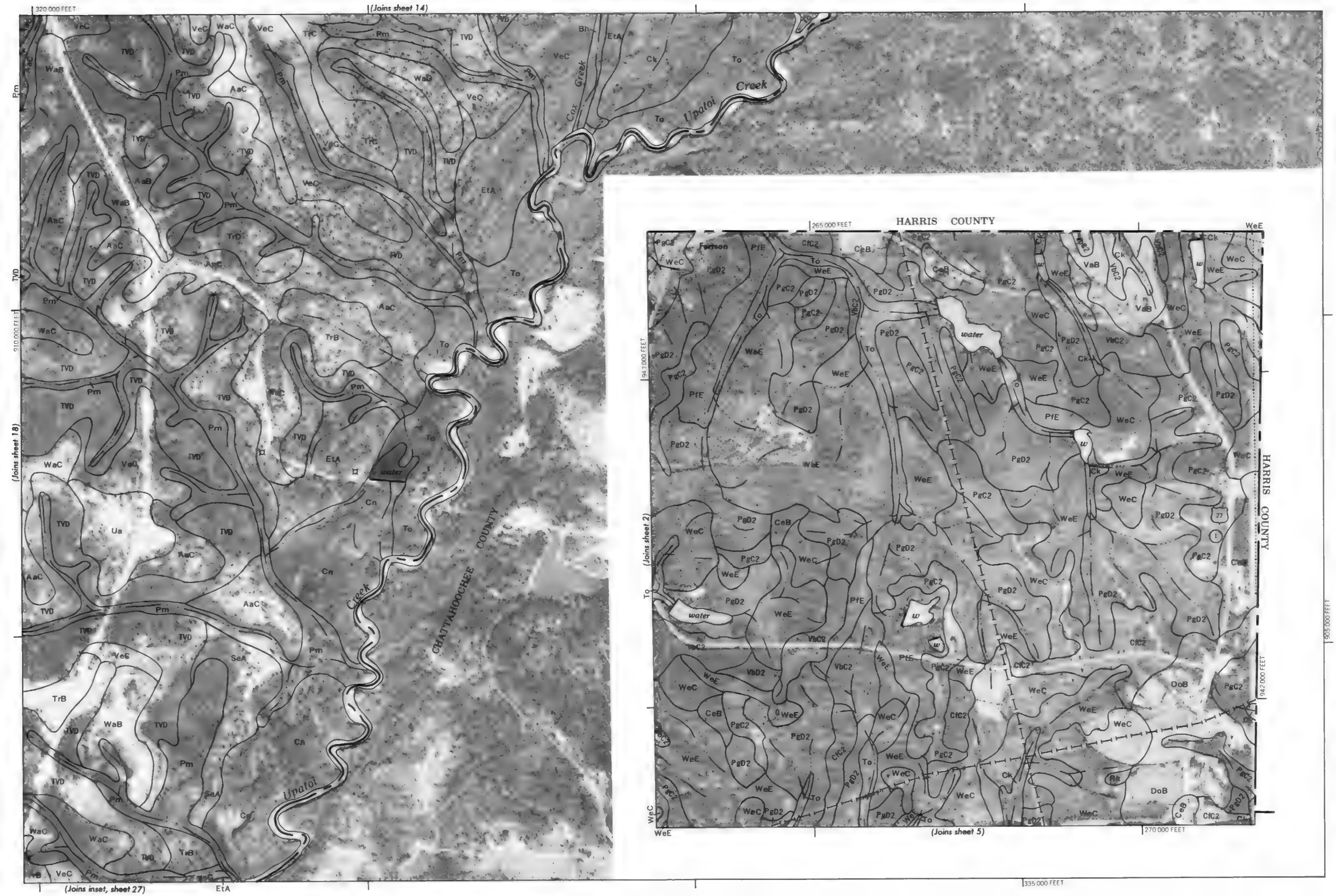
(Joins sheet 23)

FORT BENNING MILITARY RESERVATION

Dozier Creek

Randall Creek

WaB WaC TrB TrC TrD AaC Bh TVD Pm Ck SuB SuC SeA SoB EmB EtA DoB DoC TSD To Ua VeC WeC


320 000 FEET
(Joins sheet 14)
910 000 FEET
(Joins sheet 18)
(Joins inset, sheet 27)
EtA
335 000 FEET
265 000 FEET
HARRIS COUNTY
947 000 FEET
(Joins sheet 2)
(Joins sheet 5)
270 000 FEET
905 000 FEET
942 000 FEET
CHATTAHOOCHEE COUNTY
Cox Creek
Upatoi Creek
water
19
N
5,000 Feet
1 Kilometer
Scale - 1:15840

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 20

20

N

5,000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 15)

260 000 FEET

900 000 FEET

890 000 FEET

245 000 FEET

(Joins sheet 21)

(Joins sheet 24)

COLUMBUS

CHATTAHOOCHEE

RIVER

RUSSELL COUNTY - ALABAMA

Weracoba Creek

Lindsey Creek

Bull Creek

Avondale

Dinglewood

Wynnton

Woodhaven

Willett

CENTRAL OF GEORGIA

SOUTHERN

SEABOARD COAST LINE

GEORGIA

CEMETERY

DuB

Ud

Bh

EuA

AaC

DoB

EtA

Ua

DgA

MaA

Pm

TrB

To

EpA

WhA

Ch

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 21

265 000 FEET

(Joins sheet 16)

21

N

900 000 FEET

Glen Arden

Vista Terrace

Rushin Heights

Linden

Englewood

Parkchester

St Marys Hills

Sunset Terrace

Bull Creek

Mill Branch

CENTRAL OF GEORGIA

UNDERGROUND CABLE (APPROXIMATE LOCATION)

MILITARY RESERVATION BOUNDARY

FORT BENNING

MILITARY RESERVATION

(Joins sheet 20)

(Joins sheet 22)

(Joins sheet 25)

280 000 FEET

890 000 FEET

5,000 Feet

1 Kilometer

Scale · 1:15840

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 22

22

N

(Joins sheet 17)

EtA

300 000 FEET

FORT BENNING MILITARY RESERVATION

UNDERGROUND CABLE (APPROXIMATE LOCATION)

Wolf Creek

Scale - 1:15840

5000 Feet

1 Kilometer

(Joins sheet 21)

(Joins sheet 23)

890 000 FEET

(Joins sheet 26)

285 000 FEET

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 23

23

N

305 000 FEET

900 000 FEET

(Joins sheet 18)

(Joins sheet 22)

(Joins inset, sheet 27)

(Joins sheet 27)

890 000 FEET

320 000 FEET

FORT BENNING MILITARY RESERVATION

Randall Branch

Randall Creek

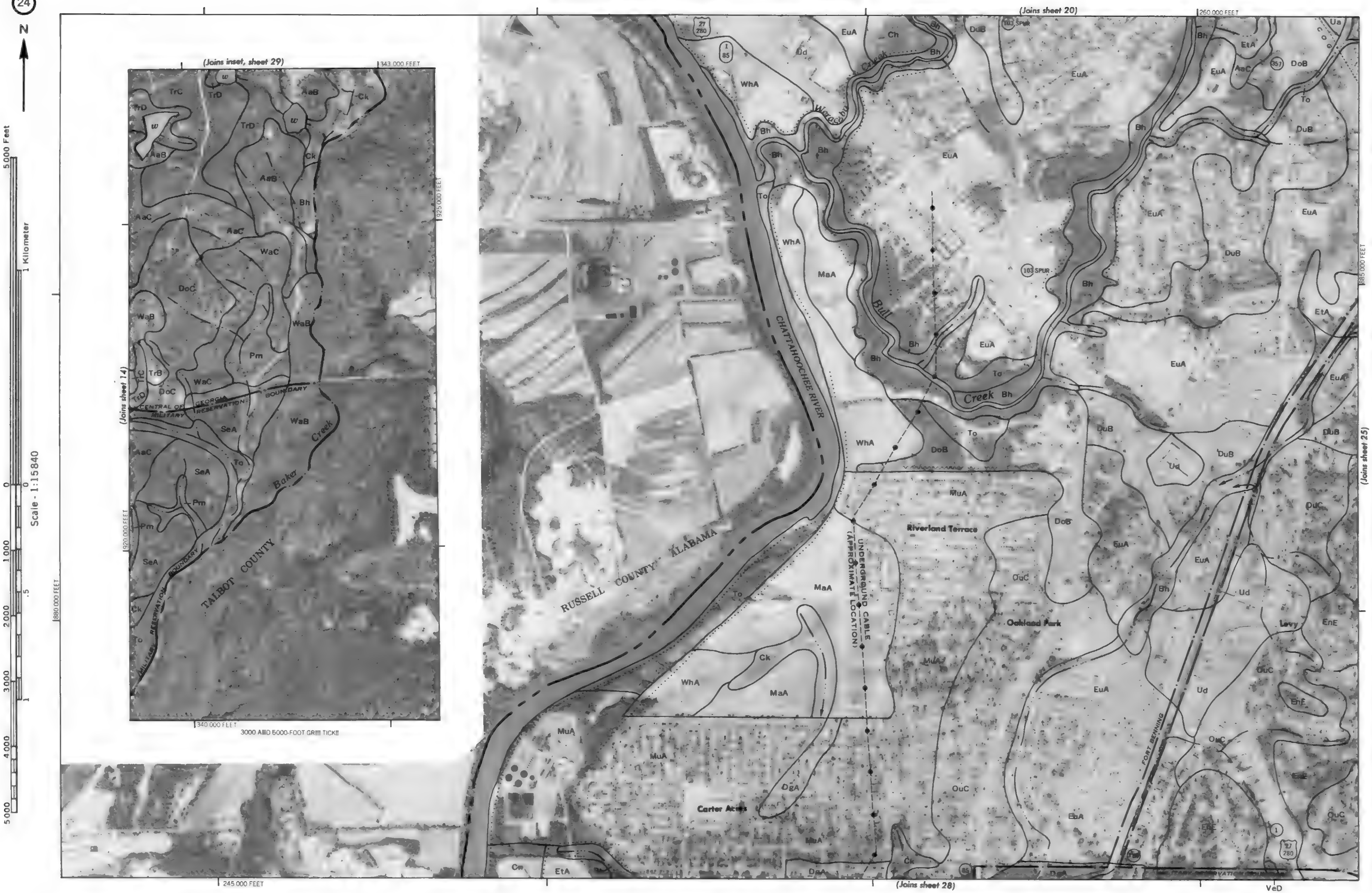
Upatoi Creek

CHATTAHOOCHEE COUNTY

5000 Feet

1 Kilometer

Scale - 1:15840


24
N
5,000 Feet
1 Kilometer
Scale - 1:15840
0
1000
2000
3000
4000
5000
0
.5
1
(Joins inset, sheet 29)
343 000 FEET
925 000 FEET
920 000 FEET
(Joins sheet 14)
340 000 FEET
3000 AND 5000-FOOT GRID TICKS
CENTRAL OF GEORGIA
MILITARY RESERVATION BOUNDARY
Baker Creek
TALBOT COUNTY
MILITARY RESERVATION BOUNDARY
(Joins sheet 20)
260 000 FEET
885 000 FEET
880 000 FEET
(Joins sheet 25)
(Joins sheet 28)
245 000 FEET
Weracoba Creek
Bull Creek
CHATTAHOOCHEE RIVER
RUSSELL COUNTY ALABAMA
UNDERGROUND CABLE (APPROXIMATE LOCATION)
Riverland Terrace
Oakland Park
Carter Acres
Levy
FORT BENNING
103 SPUR
TrC
TrD
AaB
AaC
Ck
Bh
WaC
WaB
DoC
Pm
TrB
SeA
To
WhA
MaA
EuA
Ch
DuB
EtA
DoB
Ud
MuA
OuC
EnE
EnE
DgA
EbA
Ua
VeD

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 25

25

N

265 000 FEET

(Joins sheet 21)

885 000 FEET

(Joins sheet 24)

(Joins sheet 26)

880 000 FEET

(Joins sheet 29)

280 000 FEET

5 000 Feet

1 Kilometer

Scale - 1:15840

FORT BENNING

MILITARY RESERVATION

CHATTAHOOCHEE COUNTY

GEORGIA

ALABAMA

CENTRAL OF GEORGIA SEABOARD COAST LINE

FORT BENNING MILITARY RESERVATION BOUNDARY

Tiger Creek

Upatoi Creek

Steam Mill Creek

Opassum Creek

Benning Hills

water

26

N

5 000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 22)

(Joins sheet 25)

(Joins sheet 27)

300 000 FEET

285 000 FEET

FORT BENNING MILITARY RESERVATION

CHATTAHOOCHEE COUNTY

Upatoi Creek

Wolf Creek

Steam Mill Creek

Long Branch

CENTRAL OF GEORGIA

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 27

27

N

305 000 FEET

885 000 FEET

(Joins sheet 26)

SeA (Joins sheet 23)

Randall Creek

Upatoi Creek

CHATTAHOOCHEE COUNTY

CHATTAHOOCHEE COUNTY

WaC (Joins sheet 19)

323 000 FEET

900 000 FEET

(Joins sheet 23)

895 000 FEET

880 000 FEET

320 000 FEET

3000 AND 5000-FOOT GRID TICKS

320 000 FEET

5 000 Feet

1 Kilometer

Scale - 1:15840

28

N

5 000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 24)

260 000 FEET

875 000 FEET

865 000 FEET

245 000 FEET

(Joins sheet 29)

CHATTAHOOCHEE RIVER

ALABAMA

RUSSELL COUNTY

MILITARY RESERVATION BOUNDARY

FORT BENNING

MILITARY RESERVATION

UNDERGROUND CABLE (APPROXIMATE LOCATION)

water

Upatoi Creek

CHATTAHOOCHEE COUNTY

Bh EtA Cn Ua To Ck MuA DgA OuC EnE EPE EOD TSD OrC OrB VeD TVD LaC LaE TrC EtA WaB WbA

MUSCOGEE COUNTY, GEORGIA — SHEET NUMBER 29